STAFF WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)
	)
OUTDOOR LIGHTING STANDARDS	)
RESEARCH REPORTS	)
	)

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET

HEARING ROOM A

SACRAMENTO, CALIFORNIA

TUESDAY, JUNE 18, 2002

10:04 A.M.

Reported by:
Peter Petty
Contract No. 150-01-005

STAFF AND CONSULTANTS PRESENT

Gary Flamm, Chairperson

Bill Pennington

Maziar Shirakh

Charles Eley

Lawrence Ayers

Nancy Clanton

Lisa Heschong

James Benya

ALSO PRESENT

Gary Fernstrom
Pacific Gas and Electric Company

Thomas Trimberger
California Building Officials

R. James Claus
The Signage Foundation

John Hogan
City of Seattle

Jack E. Sales
California Sections, International Dark-Sky Association

Dawn DeGrazio
Sacramento Municipal Utility District

Mitch Gutell
bp - ARCO

James O. Abrams
California Hotel and Lodging Association
California Restaurant Association

Leslie E. Davis
Auerbach and Glasow

ALSO PRESENT

Thomas M. Tolen
TMT Associates

Patrick McDermott
Sunbelt Industries, Inc.

Kerry D. Moore
GELcore

Mark Gastineau
Young Electric Sign Company
California Sign Association

Joseph Landers
Allanson Lighting Electrics

James F. George
Permlight Products, Inc.

Jim Sloan
SloanLED

Jeff Aran
Sign Users Council of California

Lisa Bruhn
San Diego County Section, International Dark-Sky Association

Cheryl J. Fraga
GARDCO Lighting

I N D E X

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P R O C E E D I N G S

10:04 a.m.

MR. FLAMM: Welcome, everybody, to the outdoor lighting standards staff workshop. I'd like to start by having the project team introduce themselves, and so we'll start here on my left.

MR. SHIRAKH: I'm Mazi Shirakh, engineering in the energy efficiency division.

MR. PENNINGTON: I'm Bill Pennington; I'm the Manager of the 2005 building standards project, of which the outdoor lighting is a part of.

MR. ELEY: My name is Charles Eley; I'm the primary contractor to the Energy Commission for this project. And many of the other people around the table are subcontractors to us.

MR. AYERS: My name is Larry Ayers and I'm a lighting engineer with Eley Associates.

MS. CLANTON: And I'm Nancy Clanton, sub-consultant to Eley and Associates of Clanton and Associates.

MS. HESCHONG: And I'm Lisa Heschong; I'm an architect with Heschong Mahone Group, and also subcontractor to Eley Associates.

MR. FLAMM: Thank you. There are two

other members of our project team that are not here. One is Jim Benya; he will be calling in around 11:00. And Roger Wright from RLW Analytics.

And I'd like to ask Bill to make a few comments, please.

MR. PENNINGTON: We got some early comments from some of you that indicated that you were kind of stressed about the extent of work that we're doing, and how quickly we're trying to go and so forth.

And I wanted to just maybe allay some of those concerns a little bit at the outset here. We are trying to do a fully comprehensive job here in response to the SB-5X mandate. And we are trying to cover all light functions, and that's our intent. And we don't think that we would be adequately responding to the legislation if we failed to do that.

So, I know some of you would prefer probably for us not to regulate particular kinds of lighting, but we certainly are, at this point, planning to pursue all of the major lighting opportunities in outdoor lighting.

So we intend to do that evenhandedly,

and we're trying to develop approaches that are reasonable and will work in the field.

We're very much interested in your comments relating to that and helping us to do that; helping us to increase the effectiveness of what's being proposed.

And this is actually an early point in the process. We're planning to adopt standards a little bit over a year from now. In July of 2003 is our target for adoption.

Backing up from that timeframe we're going to be doing a formal rulemaking proceeding where we'll be holding hearings and the Commissioners will be presiding. And that will occur in the February to July timeframe of next year.

Prior to that we will be in the September of this year to February or so of next year time period, we're going to be putting out draft standards language that is, you know, trying to look as real as possible and trying to deal with all the details as thoroughly as possible so that you can see what those standards would look like, and you can react to them and comment on them.

And then we intend to hold a series of workshops between September and February to take your comments.

So, you're actually going to get several bites at the apple here to provide your comment. And we will be trying to respond to your comments in a way that we think is responsible and hopefully you will think is responsible.

So, anyway, I wanted to start out with that. We appreciate your input. We've asked for it; we're seeking it. We'd like to have your constructive comments. It's really good that you've taken the time to look at the proposals and have come to comment. So, we appreciate that.

Thank you.

MR. FLAMM: Thank you, Bill. I'd like to ask everybody, if you haven't signed the sign-in sheets on the outside table, to please do so sometime today. There are handouts on that table including the proposal from the project team. And some comments we've received from other folks.

This workshop is being webcast. Welcome to anybody on the webcast.

I am going to try to stick to this agenda as much as I can. We are going to have to

juggle it because our subs have some planes to catch, so there may be some juggling.

What I'm going to do is at various points I'm going to open this up for discussion. We're going to have our project team members make presentations. We're going to have a period of Q&A. I'm going to ask each of you to come to the podium if you're not sitting at the table next to a microphone, and identify yourself every time you speak, because this is being transcribed. The transcription will be on the web, I believe in about four weeks, is that correct? So in about four weeks a transcription of this workshop will be on the web.

And with that I'm going to start the agenda and ask Charles to make a few -- overview, please.

MR. ELEY: Okay. Thank you, Gary.

Next slide, please. I think we've already introduced the project team; they're listed again here.

Next slide, please. This is an overview of the agenda. We're basically going to cover the various chapters in the research report that's sitting outside. And this slide shows who the

authors are of those various sections.

Next slide, please. The goals of the project is really to conserve energy and to reduce electric demand. There are other benefits that can be connected with the standards such as reduced light trespass, light pollution and other benefits as well.

But as we're justifying the standard, these other benefits are not considered. The standard is justified solely on cost effectiveness to the building owner. And the cost effectiveness model that we're using is one that's already been adopted by the Commission and it's being used not just for this project, but for the overall standards update project, as well.

Next slide, please. This is a little hard to read, but if you turn to page 1 of the research report, this content is there. We're proposing standards for unconditioned buildings, parking lots, building grounds, entrances and exits, facades, point-of-sale canopies, outdoor sales, billboards and signs, and public rights-of-way.

We're not proposing standards for traffic signals or sports lighting, illumination

of public monuments, ATMs, decorative gas lighting, theatrical lighting for outdoor amphitheaters and that sort of thing, exit signs, any lighting that's required by health or life safety statute. And emergency lighting, which is powered by an emergency source, as defined by the California Electric Code.

So that's the overall scope of the project.

Next slide, please. The mandate for this project came from Senate Bill 5X, which was in response to California's electricity crisis. The Legislature, in this bill, gave the California Energy Commission authority and responsibility for adopting energy efficiency standards for outdoor lighting.

The language says that the standards shall be technically feasible and cost effective. We've tried to show that in the research report.

And it also establishes the scope of the standards, which is really quite broad. It includes street lights, traffic lights, parking, billboard lighting. These things are specifically mentioned in the bill that was passed.

Next slide, please. A rulemaking such

as this is subject to the California Environmental Quality Act, CEQA. And it's simply the process the Commission will be filing probably a negative declaration on this project, because we believe that there are no negative environmental impacts associated with this proposed standard.

There's a lot of positive impacts, energy savings being the principal benefit. But also light trespass and pollution should be reduced. The need for new power plants should be reduced. And air emissions related to power plant operation would be reduced, as well.

Next slide, please. As Bill mentioned, the goal is to adopt this standard in about a year from now, in July of 2003. The standard would not become mandatory until 2005.

During that interim period we anticipate that the utilities and others, through public goods charges, would provide incentives for early adoption of the standards. And also as Bill mentioned, the CEC is encouraging public participation in this process.

Next slide, please. This, again, is a little hard to read, but if you turn to page 3 of the research report you can see these dates. This

project began in January of this year. We, at that time, had a kickoff meeting with the subcontractors. On February 1 the outdoor lighting website was launched at the Commission.

On March 27th we had a public workshop here in this room to discuss the scope of the outdoor lighting project, and to get input from interested parties.

Today we're having a workshop that we're going to be reviewing the results of the research. In August or perhaps September we will have a draft standard. This draft standard will be a part of the Title 24 update project that we include not only outdoor lighting, but upgrades in terms of interior lighting, building envelope measures, HVAC measures, water heating measures and other building energy efficiency measures.

One thing I would like to mention here is that lighting standards have been on the books in California for more than 20 years. We have control requirements for interior lighting. We have lighting power densities for interior lighting. Lighting power densities are expressed in maximum allowable watts per square foot, or watts per lineal foot.

And what we're proposing to do here is to extend the scope of these lighting standards to outdoor lighting applications. So we have experience under our belt in enforcing standards such as this.

Next slide, please. I'm going to give you a very quick summary of the requirements that are being proposed here. And then each of the researchers will go into them in more detail and explain how they were developed.

One of the fundamental changes is section 100(a) of the standard will be modified so that lighting in unconditioned buildings is regulated, as well as lighting in conditioned buildings. This provision in the standard now basically limits the scope of the standard to conditioned spaces.

We also expect to extend the standard for major outdoor lighting renovations as well as completely new construction. And we are proposing, as you'll see in a moment, new standards for many outdoor lighting applications.

Next slide, please. One of the requirements that's being proposed is a lighting efficacy requirement. A standard like this is

actually already on the books and is being enforced.

Outdoor lighting in wattages greater than 100 watts must have an efficacy greater than 60 lumens per watt. This effectively requires fluorescent or metal halide lamps or high pressure sodium lamps in wattages greater than 100 watts.

This efficacy requirement is now limited to lighting which is on the building meter. This exception would be deleted, so that this efficacy requirement would apply to all outdoor lighting whether it's on the building meter or not.

And then as you'll see when we get to some of the sign requirements, we're proposing to expand and modify the minimum efficacy requirement for sunlighting applications. I won't go into that in detail now.

Next slide, please. The lighting power densities that are currently in the standard do not apply at present to unconditioned buildings. The only reason for this is because the Energy Commission, up until SB-5X, didn't have the authority to do standards for unconditioned spaces. Unconditioned spaces were essentially exempt.

SB-5X does give the Commission authority to write standards for unconditioned spaces. And many of the lighting power density requirements that are presently on the books would apply straight across the board to unconditioned spaces.

There's only one new lighting power density requirement that's being proposed as part of this proceeding, and that is for parking garages. And Larry will cover that in a little more detail later.

Next slide, please. The standards already have a requirement for a photocell or an astronomical time clock that will turn off lighting during periods of time when it's not needed.

We're also proposing that a control be added for parking lots, building entrances and outdoor sales areas which would be capable of reducing the lighting level to 50 percent of full output. This would enable lighting to remain on, but at half brightness during curfew hours or at other times.

The analogy here is really the bilevel illumination requirement in interior spaces. So we're proposing a similar kind of control

requirement for outdoor lighting, as well.

Next slide, please. Outdoor luminaires larger than 100 watts would need to be of the cutoff variety, not the full cutoff, but the cutoff requirement, cutoff type. This was recommended by NEMA at the March 27th workshop. And this is a part of the requirements for many of the lighting applications.

Next slide, please. This is a summary of the allowed lighting power numbers. You'll get more detail on these later. This is also on page 5 of the research report, in the likely event that you're unable to read this slide.

(Laughter.)

MR. ELEY: And these values are also repeated under each of the research topics.

Next slide, please. In developing these standards we followed a common research methodology. That research methodology was to first of all establish the design criteria. How much illumination, what type of uniformity, et cetera, is recommended by the IESNA. The IESNA is considered the authority here. And we're leaning on their recommendations as much as possible.

We have four lighting zones. For most

of the measures the lowest IES -- the highest IES in a recommendation is used for lighting zone three. The lowest for lighting zone two. We took 50 percent of the lighting zone two number and used that for one. And we doubled the lighting zone three number and used that for four.

That's the general rule that was used.

Now, there's some variation on that as you will see in each of the research topics. But that's the general approach.

The second step in the research methodology was to identify the most effective, the most efficient lighting equipment that can do the job. We did lifecycle cost analysis when appropriate to justify the efficient equipment.

After that we developed lighting models. And these lighting models are a typical outdoor lighting application that captures a parking lot or a building facade or a building entrance.

And we did calculations using the suggested lighting equipment to show that at the proposed lighting power densities that we're recommending that the IESNA recommendations can be achieved and exceeded in most cases. So that's the general approach, is to demonstrate that with

cost effective lighting equipment, that the IESNA designed recommendations can be achieved.

For billboards you'll hear that we used a slightly different methodology that's based on manufacturers' recommendations.

So that's really a summary, Gary, of the overall project. And I guess now we can go into details on each of the measures. But first we're going to, I guess, hear about the PIER project.

MR. FLAMM: Thank you, Charles. Each one of the measures is going to be presented, and at that point everybody will get an opportunity to make comments. I think it would go smoother if we proceed there before we entertain any comments.

First I'm going to -- there's another study going on; it's the Public Interest Energy Research study that we think is relevant to this project. It was to be presented by Donald Aumann from the Energy Commission. And he sprained his ankle last night. So, Mazi Shirakh this morning found out that he's going to be making this presentation.

(Laughter.)

MR. FLAMM: So at this time I'm going to turn this over to Mazi.

MR. SHIRAKH: Good morning; I'm not Don Aumann.

(Laughter.)

MR. SHIRAKH: The purpose of this study was to determine the baseline for outdoor lighting in this state. And we, through our PIER program, commissioned a study. We sent teams of contractors throughout the state to sort of determine, you know, what type of lighting equipment we have out there, what are the connected watts, light and power densities. And what type of lighting equipment is being used for a variety of outdoor lighting.

Next slide, please. This study started in early 2001. And at that time is when we sent our team of contractors to the various sites throughout the state.

It was conducted by RLW Analytics. And the New Buildings Institute managed the whole project.

Next, please. The intent of the study was to conduct a statistically valid survey. I believe we surveyed over 400 different sites. And the intent was to have enough sample for each function areas to make it statistically valid.

We're looking at it, we have more examples in some areas than others; but, again, the intent was to have enough in each function areas to make it statistically valid.

And the intent was to identify the type of technologies that were used for lighting. And with that data we could assess the potential for energy savings through improved technologies.

Next, please. Again, we looked at a wide range of facility types, parkings, entries, retail sales, and that include some car lots, included some gas station canopies. We looked at walkways, bikeways, and -- also.

The data that they collected included the lighting power density. And the lighting power density is a concept that we've been using for indoor lighting and some outdoor applications for over 20 years. And it's basically expressed as watts per square foot or watts per lineal foot.

So, you know, when we send our team out there we wanted to know, you know, what is the connected power for these areas, function areas that we're serving.

And along with that we asked them to look at the footcandle that was the illumination

levels. And so with the two sets of data it would give us a pretty good idea of what's out there, how much power is connected, what's the illumination level, what type of equipment we're using, how old they are, and what would be the potential energy savings if we went to more efficient equipment.

Next, please. Again, you know, we're interested to know how much mercury vapor is being used; how much standard metal halide is being used; incandescent; high pressure sodium. And there is actually quite a bit of this still out there, even though we know the state of technology has improved quite a bit.

For instance, the pulse start metal halide would give you much higher illuminance. They have better lumen maintenance characteristics for the same input watts.

One of the things we had to consider when we were doing this is when you measure the luminance levels you have to account for things like lumen depreciation, dirt factors and other factors that would impact the footcandle level.

So to get a comprehensive idea we need to have that data, too. And, you know, we've

asked our team to ascertain some of the data that they can, although that was one of the more difficult tasks to do.

The survey was completed in second quarter of 2002, and the data analysis is still ongoing. The results are expected in late summer. We have some preliminary data as of today, but it's still very preliminary.

And what we're going to do is when we have the results of this we are going to look at the LPDs, the power densities, and the illuminances that was derived from this survey and compare that against what we're recommending as standards, as a reality check. To make sure, you know, that we're not off by orders of magnitude.

And from what we have witnessed so far is that, you know, we are actually in pretty good agreement with what is going on. And, again, you know, once we have the final data in late summer, then we can do a better job of that.

Next, please. That's it.

MR. FLAMM: Thank you, Mazi. Just so everybody knows, these slides that we're going through today will be put on the outdoor lighting website, so I hope to, within a week, have those,

if you would like to look at those.

And the PIER study, I am pretty sure, will end up on the PIER website when it's completed. And I assume will have a link to it from the outdoor lighting.

Anybody from the project team have any more comments on this PIER study that -- no? Okay. Thank you.

Does anybody have any comments at this point? I would ask you, if your comments are more relevant to the measures, to save your comments for that point, because we want to keep this moving. But does anybody have any comments? Mr. Trimberger.

MR. TRIMBERGER: I'm Tom Trimberger representing California Building Officials. Charles, you mentioned that traffic lights are not adopted in the standards even though that is in the SB-5X. Is there a reason why that wasn't looked at? That's easy changeouts that will lead to a lot of energy savings.

MR. ELEY: They're easy -- I think it's the view of the project team that most of the new traffic lights that are going in are already LEDs and there's probably not a lot of need to write a

standard around that.

MR. FLAMM: Charles, if I could answer that. I believe the Title 20 process actually has that on its radar to look at the efficacy of traffic lights.

Currently I believe that the traffic lights for intersections are already in Title 20, but the pedestrian lights were left off. So that is being looked at through the Title 20 process which is separate from this proceeding.

Any other comments? Mr. Fernstrom.

MR. FERNSTROM: Gary Fernstrom, PG&E. With regard to capturing the total background for this effort, didn't Governor Davis issue an executive order a couple of years ago that affected outdoor area lighting?

It seemed to me there was an executive order that required that outdoor lighting be reduced in its intensity to 50 percent during the night.

MR. FLAMM: That is correct. Governor Davis signed executive order D19, I believe it was 00. And that requires marketing lighting to be cut off, shut down by 50 percent after business hours. And it also says that it would not

compromise on security lighting. So the two components of it. And that executive order is still relevant.

MR. FERNSTROM: Thank you.

MR. FLAMM: Okay, then I would like to proceed then, and have Lisa Heschong present the first measure on lighting zones, which is basically a foundation that all the other measures are built on. It's not an individual measure. Lisa.

MS. HESCHONG: So, good morning. I'm Lisa Heschong. As Gary mentioned, the lighting zone is a cross-cutting concept that applies to all of the other measures we'll be talking about today.

Next slide.

(Off-the-record discussion.)

MS. HESCHONG: So, first of all, both IESNA and CIE, which is the international body dealing with illumination standards, have recognized the need for lighting zones which they have termed environmental zones, we have termed California lighting zones.

The basic approach adopted by both bodies has been to establish a four-zone system.

And they have developed a policy that future recommendations and future analysis will be based on this four-zone system.

So the California Energy Commission has adopted the same four zone approach in order to be consistent with these two professional bodies and their developing future recommendations.

We have identified four lighting zones; we call them LZ1 through LZ4. LZ1 are identified as areas of intrinsic darkness, where one expects he nighttime to be dark. Lighting zone 2 identified as rural areas and areas of low ambient brightness at night.

Lighting zone 3 are identified as urban areas, densely settled areas, and areas of high ambient brightness. And then lighting zone 4 are identified as special uses, areas of the highest ambient brightness intensive nighttime use.

So that's basically the gradient that's being applied throughout all these measures.

Next. So here we have a photograph that's capturing the issue of nighttime illumination. The key concept here is that in order to be able to be seen at night a illumination source is compared to the relative

brightness of its surrounds.

So that if it's an extremely dark area, you need less inherent brightness in order to be seen and for visibility. Whereas if you are an extremely brightly lit environment you need relatively more brightness, both in order to achieve visibility, but also because people in that environment will be adapted to a higher level of illumination. Their eyes will require higher level of ambient illumination for the same task.

Next. So basic concept here is the human visual system is extremely adaptive. We can see through a huge range of brightness.

Next. Eyes, however, need a certain amount of time in order to adapt to a change in brightness. Older eyes especially need an even longer time to adapt. So in order to preserve our usefulness of night vision, especially when we are in inherently dark zones, the effort is to use less light in inherently dark zones so that people can preserve their night vision and continue to function very well.

Next slide. Keep going. So our range of illumination at nighttime varies from about .1 footcandles in some lit environments up to

interior illumination levels that pursue on the order of 100, maybe slightly above 100 footcandles. That's basically the range that the human eye is functioning within.

However, once we are adapted to the high levels we have a longer time to get down to adaption to the lower levels.

Next slide. We've also got a society which strongly favors the presence of illumination, where illumination is perceived as security, where illumination is needed for retail functions. And we have a vastly growing use of outdoor lighting, almost an explosive use of outdoor lighting in our culture.

Next. There are a range of uses for nighttime lighting. Light as entertainment is very well received and has great artistic effects and is certainly greatly appreciated by retailers, adult entertainment sections of the city have wonderful and delightful uses of nighttime lighting. On the flip side.

Next. We have the other side, which is the natural world of darkness where darkness is actually needed for natural areas, for national and state parks, for wildlife preserves and

furnish that appreciation of the night so that you can see the stars.

So we have a range of uses of light at night. And our approach to lighting zones is to try to accommodate all of these varying uses of the nighttime and its relationship to illumination.

Next. So, the goals of establishing these lighting zones are to allow us to set energy metrics which are appropriate for the intensity of human use. If we did not have a lighting zone approach we would have to establish the minimum levels at the highest need throughout the state.

So basically whatever the highest need of illumination would be would be set as a standard consistent throughout the state without recognizing this range of illumination needs at night.

The lighting zone approach allows us to tailor the maximum energy use allowed to the intensity of the human use of the space. It allows for high intensity lighting uses such as retail, entertainment, security needs, while also allowing for natural darkness to preserve adaptation levels in areas of intrinsic darkness.

The particular approach we've adopted is also proposing to allow local jurisdictions to adjust the lighting zones according to their own standards. So that even though the California Energy Commission is proposing a set of defaults of how these zones will be applied, mostly to establish a uniform approach to how they're adopted, there will be a process at the local level to adjust it to local preferences, either up or down.

Next. The approach in defining the lighting zones is to identify standard geographic regions that we can reference, that we can immediately understand how the lighting zone will be applied to that particular area or that particular address.

The geographic regions need to be related to the intensity of human use. They need to be at a fairly fine grain so that they are actually responding to how people are using the space. And they need to be legally referenceable. And updated relative so they can't be static; they need to be updated as things change, as areas develop.

What we have identified is that the U.S.

census provides a process to do that. They define, they legally define the difference between rural and urban areas throughout the United States based on the census which is updated every ten years.

So this definition of rural versus urban areas is used in numerous legal documents at both the federal level and at the state level. And it follows a fairly complex set of rules that look at population density and contiguous uses so that it identifies areas that you would perceive as urban as urban, and areas outside of that as rural. It's such a fine grain that there are little pockets of rural within cities, basically.

Next. So here we've got two examples of how this plays out. The U.S. census uses the granularity of the census block to define these urban versus rural areas. So it's at a very fine grain in the dense urban area that may be at the level of two or three city blocks in a rural area that may be on the order of a couple square miles, depending on the population density.

And then they produce maps that identify these different areas, so the one on the right shows the difference between urban and rural out

in Riverside County.

Next. Here we've got another map which is identifying urban versus rural areas in 1990, per the 1990 census for the Bay Area. And you can see how they play out.

So what we are proposing then is that in this map the areas in pink would become LZ3 by default, lighting zone 3. The areas in yellow would become lighting zone 2 by default, rural areas. And then within each of those there would be special cases that could either be taken up a level or down a level to LZ4, LZ2, LZ1.

Next. So our proposed lighting zone areas, lighting zone 1 would include state and national parks, recreational areas and wildlife preserves.

And then local jurisdictions could selectively decide to designate certain portions of their LZ2 areas down to an LZ1 if they felt that there was a need for preservation of intrinsic darkness at night.

In LZ2, it's the U.S. census rural areas, but there could be special districts, again designated by the local area that would either go up to LZ3 as urban brightness, or LZ1 down to the

intrinsic darkness.

In LZ3, which would be the urban areas, and again as Charles said earlier, has been used as basically our default condition using the highest IES recommendations throughout. That would be the standard for most urban areas in California.

Local jurisdictions could designate smaller portions of LZ3 up to an LZ4 or down to an LZ2. And then LZ4, our special districts, there are no state defaults for LZ4, but the local jurisdiction can choose certain areas. And then within the document there are limits set on how large that can be. So that a city cannot choose to designate its entire territory as LZ4.

Next. So proposed rules of how we're proposing to apply this is first of all lighting zone 1 through 3 will be determined by the default rules I have described. LZ1 through 4 can be modified by local jurisdictions.

There are limits on the adjacencies of zones, so that LZ1 will not be adjacent to an LZ4, but there's a certain separation requirement. And there are also limitations on size for the higher intensity uses. So special locally designated LZ3

and LZ4 districts have limits on how large they can be.

Then these lighting power densities as recommended by the other measures all vary by zone and control requirements also vary by zone.

So that is the discussion of lighting zones. And I'd be happy to take questions or comments.

MR. FLAMM: Okay, please turns the lights up. And anybody have any comments they would like to make?

Okay, please come to the podium and introduce yourself.

DR. CLAUS: Robert James Claus, 22211 Southwest Pacific Highway. I'm here on behalf of part of the organized sign industry, California Electric Sign Association, International Sign Association.

First, generally I want to make a comment and then I want to ask a specific question and would like an answer for the record, particularly by the person doing lighting zones.

It is my understanding that what you're doing is regulating all of so-called forms of light, including signs. Now, unless I

misunderstand the law, and I'm pretty sure I don't, since the leading case started in California over something like this intrusive behavior, Metromedia v. San Diego, is you are, in fact, attempting zoning provisions for lighting. Be it it's a little crude, but it is zoning.

Now, if I understand, that means you have to follow Ambler Realty v. Village of Euclid. That secondarily means that you have to follow NecTow v. Cambridge, which is variance provisions particularly in signs.

And it thirdly means that you have to follow federal rule on this because you are now into First Amendment regulation. Sign code regulations must be time, place and manner, content neutral.

Even if they are that, there must be a substantial benefit, it must be provable, and you must scope that regulation as narrowly as possible. And as late as yesterday you've had the Supreme Court redefining those restrictions. I can give you a list of them if you'd like them, but they are now extensive. And they all say don't try to correct a zoning problem, 44 Liquor Mart v. Rhode Island, with a communication

manipulation.

In order to construct your zones you have to have demonstratable proof, since you are content based in this regulation, and I will give you just one example that is pure content based. You can't look at this without going to the content of the message. Sport lighting. Tell me what that is.

Then you go down, decorative gas lighting. And then you go a little further and talk about theatrical purposes. I make a living in the business and I don't know what that means. So it's content based, so it's going to have prior restraint additions to it.

Who told you that any Supreme Court state could, has allowed you, in these zonings, to suggest signs are a public nuisance and that there is no substantial economic loss from this kind of intrusive regulation. And -- the Supreme Court case that supports that zoning manipulation.

Now, the reason I'd like -- to do that because if they don't know that, and I would suggest after reading your bibliographies, given the sources you've read, you've very narrowly crafted this to people who are encourage intrusive

regulation and litigation.

So, what's the source for the Supreme Court upholding the fact that this light is some kind of trespass?

And then I'd like you to tell me if you have a compliance agreement with the manually uniform traffic control devices how you're going to deal with your compliance agreement since you're outside their standard care.

Those may seem like small questions but they should begin to point out your conceptual problem. You can regulate an activity, but you have gone much further than that, you are regulating speech.

And you are using rational relationships, not intermediate scrutiny and strict scrutiny to do it, which means I don't know of anything that sustains your so-called proof. And anyone who thinks there is not negative results from what you're doing had better take the time to go back when this first came up and why the administration pulled out the regulation on signs.

First, we are not a peak or demand signs. Just that simple. Secondarily, assuming

you can find language in here allowing you to regulate signs, which I don't think you can, in the legislation, itself, you have a more serious problem.

When you start interfering with guidance systems you are increasing energy consumption of petroleum. And that simply is an established fact; and that's the reason the lighting ban was dropped both in Oregon and at the federal level.

So I would suggest, unless someone can tell me about some research I don't know about, that will stand up in court, I'd just like somebody to tell me about this nuisance legislation instead of federally.

And I also want you to know that bear in mind the Ninth Circuit is harder to rule than your lighting manipulation in Blockbuster v. Tempe. Lighting manipulation is First Amendment speech manipulation. Read the case.

So we'd like you to come up to our level so that we don't need to come here in such a, and apologize way to say you're intruding in this in a way.

So can you tell me where this nuisance legislation is? Other than dark sky's

imagination?

MR. FLAMM: Thank you. Would you please stay there in case we need some dialogue. I'd like to ask the project team to make a few short responses.

MS. HESCHONG: Okay. My response would be that there is no discussion here of nuisance. There is no discussion here of trespass. There is no control on content. There is only discussion of the efficiency of the system. And that is clearly the intent of the Energy Commission, is to regulate the efficiency of the efforts to communicate appropriate to the context.

By creating zones, the attempt there is to keep the context as appropriate as possible and allow for local adjustment according to local needs and local perceptions.

MR. ELEY: One other thing. This is not a sign ordinance. We're not prohibiting billboards; we're not prohibiting cabinet signs or anything else. It strictly deals with the energy efficiency of the signs.

And the California Legislature specifically identified billboards and signs as something that we should address in this

rulemaking.

MS. HESCHONG: I would suggest that since this is specifically dealing with signs, maybe we should postpone more of this discussion until we get to that topic.

MR. FLAMM: Okay, would that be fine with you, sir?

DR. CLAUS: Well, it's not fine because the problem is this. That it is in your purpose, in your goal, your scope and your rationale that in spite of what you people are saying, they're contradicting themselves.

Explain to me how in the scope you have to look at the content of what you're regulating in order to understand it if you're going to regulate it. Read the line, lighting for theatrical purposes including performance, stage and film/video productions.

You're got to get right into the content of what's going on there. And you're going to make a value judgment.

I hate to tell you this, but you might look a little carefully at some of the Seventh Day Adventist cases to find out why the Supreme Court doesn't like that.

I'm not sure you've the point of viewpoint regulation, but you're close to it. And that's content.

Secondarily, while you say this is not prohibiting, there's nothing in the law that suggests you can prohibit it; it has to be time, place and manner and content neutral regulation.

And thirdly, look in your rationale. Light pollution is outdoor lighting that is directed or reflected to the sky. That's your rationale. It goes on; it gets quite extensive.

Now, the only thing I'm suggesting is that if you are going to get to our section of lighting, then we won't be talking about outdoor advertising or what you're terming as billboards. We'll be talking on-premise business signs.

I would suggest that you understand that our disagreement starts right in the very goal and scope and rationale. No one like to be called a public nuisance. And your rationale states that's the reason for doing this. And it's quite contrary.

And I'm sorry, I've been in enough of this that I know what it reads. Now, whether the staff wants to say that or not, that's what

they've done. And the way to stop that would have been direct dialogue, not going on a website, of the Sign Associations and talking to some of their representative.

MS. HESCHONG: Sir, perhaps you could help us by telling us where the word nuisance is used in the document, because I'm not aware of that.

DR. CLAUS: Well, I don't know whether you understand what rationale means, but you've got a rationale for your regulations: While light pollution and trespass are important. There it is again. You've got it worked all the way through here.

MR. ELEY: But if you finish the sentence it says: the proposed standards are justified only from energy savings.

DR. CLAUS: And we'll turn around and tell you that's not true. We'll turn around and tell you that when you try to regulate signs, given the fact that they're on when there's usually more energy being generated than used, all you're accomplishing is revenue erosion.

I'm glad you read the rest of it then. Let's go on. And peak demand reductions.

Actually, since you're going to be forcing people to look harder for the goods, you're probably increasing energy consumption.

Now, that's your rationale for this. And we're saying in our case, maybe you're doing this with all of the businesses, you're saving peak energy and you're reducing energy. You're not doing it in our case; you'll have exactly the opposite results.

And before we accept a standard zoning approach that then gets into our content, we would like you to follow the standard research. And I would suggest in your rush to prepare this the number one site in the United States, www.sba.gov/starting/business is not referenced in here.

Now that shows you weren't really careful in doing your research. Now, the energy's going to be saying this over and over, but I'm pleading with you to understand this is going to come from an entirely different approach.

We don't think your research holds water; in fact, we think we can supply a lot of research that doesn't. But, secondarily, since you are into speech manipulation, as defined by

the Ninth and the U.S. Supreme Court, we think you've got to be very careful when you start these rationales that really are agenda pushing by certain people.

So, of course, we'll bring it up under the sign regulation; we'll bring it up under other places. But, it's very difficult for us, as an industry, when somebody says we're not calling you a nuisance, and that's your primary rationale, because you're saving so much energy.

MR. FLAMM: Thank you. Could we make sure we have your card before you leave?

DR. CLAUS: Yes.

MR. FLAMM: Thank you. Other comments? Mr. Fernstrom.

MR. FERNSTROM: I'd like to make a couple of comments or questions of Dr. Claus. He mentioned that the sign regulation or the outdoor lighting standard development process is attempting to regulate content.

It seems to me it's addressing the category of lighting. And I'm curious what the difference is between content and category. To me content means the message. And it seems like there's no effort here to regulate the message.

There is an effort to establish energy efficiency standards for different categories of outdoor usage.

DR. CLAUS: Do you want me to answer that?

MR. FLAMM: Yes, please, a short answer.

DR. CLAUS: Well, first of all, if the Ninth says we can manipulate lighting, you're manipulating the message. I will accede that may be an aberrant interpretation. And the Supreme Court may turn it over.

But since they usually tend to be on the side of regulation, not against it, it might be a very good thing to look at the Sixth in the so-called Sambo Restaurants case where it is clear that is content manipulation.

But that aside, look at what you've exempted. In order to determine what you exempt you have to look at the content of it on the speech, not the activity. This is not an activity based thing.

Now, I'm sorry, because I'm aware that usually engineers, in particular lighting engineers, have some difficulty in understanding activity and speech are different. But the moment

you start trying to say sporting lighting, lighting for ATMs, decorative gas lighting, lighting for theatrical purposes, somebody has to start looking at the content. And it's right in your scope.

And if you'll take the time to read Ladue v. Gilleo, Linmark v. Willingsboro, 44 Liquor Mark v. Rhode Island, I can go on and on; it will explain it.

But the best thing to understand this, take a careful look at Lorillard Tobacco v. State of Massachusetts. You will see very quickly what you've done here is content manipulation.

Now, you can change it, but, you know, I'm sorry, it's one of the things the Supreme Court has given us as protection from intrusive governmental actions. And the reason they've done this is because it's censorship. Call it whatever you want, it's censorship.

And I will tell you in all of the years I've worked in this country and Canada, censorship is almost always mindless. And it always has the opposite results.

You turn around and say, turn off the guidance system at night, we're going to save

energy. Cars are going to get lost. You may have accidents. We had police people constantly testify that this low lighting does, in fact, increase and cause accidents. That's a matter of public record with Sabin at the Public Utilities Commission in Oregon, when they turned over this kind of thing.

Somebody hasn't looked enough at the public record. Now, I'm sorry to bring the bad news because I know what somebody does, is it appears to be rhetorical at the least. But since I have an august body and a Solicitor General named Ted Olson who won San Diego, I think you might find the trend of stopping this kind of manipulation in content. And manipulation of speech for some supposed benefit that is not there.

Now, I know if we got to keep the skies dark so the space aliens can land, that may be a real benefit. But I'd like to see somebody put that down.

But when you start having travelers get lost and burn up fuel; when you are using revenue that otherwise -- using energy that otherwise would not be used so you are improving the revenue

of your utilities, don't try to tell me that's energy efficiency. It's not.

And also, don't tell me that you're saving energy, because in all of the cases you aren't. None of this document does that and the reason is it's too overriding and it's too broad. And I would suggest in a polite way if you don't know your regulating content, you really need a workshop with the sign industry. Jeff Aaron, Wes Miller, they've got three or four lawyers who sit down and take you right through it.

And if you like, we'll even fly in Professor Alan Weinstein from the American Planning Association, who will gladly tell you what you're doing is sign code regulation, and it's under First Amendment control.

MR. FLAMM: Thank you. I ask everyone else not to direct any more questions to other members. The purpose of this workshop is to bring information to us. And these are issues that we will look at, so whatever is brought to us. So, I would rather not have a dialogue with all of you, but with us.

MS. HESCHONG: I would like to add one piece in saying that, Gary, which is that I would

like to invite you, Dr. Claus, and your industry to engage with us in a discussion about how we can achieve greater efficiency in signage while having no intrusion into content. So I think that is the discussion that needs to happen, and we welcome it.

DR. CLAUS: We'll be more than glad to do that. We do that all of the time. It's an educational process of understanding you're dealing with --

MR. FLAMM: You need to come to the podium.

Mr. Fernstrom.

MR. FERNSTROM: Okay, so I have just one more comment. It's not a question intending to engage in dialogue. And that is speaking as a representative of the Pacific Gas and Electric Company, an investor-owned utility, I'd like to emphasize that energy efficiency offpeak is important, just as energy efficiency onpeak.

During the statewide electric crisis the price of offpeak energy was incredibly high. And I don't believe that we can jump to the conclusion that just because energy is being used offpeak, energy efficiency is not equally as important.

MR. FLAMM: Okay, thank you. Mr Trimberger.

MR. TRIMBERGER: Tom Trimberger representing California Building Officials. You talked about the way that the zones, when the local jurisdiction will be required to officially adopt modifications and notify the CEC of any changes, along with the GIS coordinates, things like that.

What do you see as the required formal public comment and review process? Is this going to a planning commission, a city council, whoever makes the zoning determinations, then?

MS. HESCHONG: Yeah, the assumption is that the local jurisdiction's normal public process would be followed, whatever that may be. And then the Energy Commission would be notified with a comment period and with sufficient information so that they can post the information correctly.

So that there's simply a standardized procedure in order to create an orderly process of identifying these new areas and posting the information so that it's available publicly.

We haven't proposed the procedures yet.

We're simply proposing that they follow an orderly public process.

MR. FLAMM: Do you have any additional comments, Mr. Trimberger?

MR. TRIMBERGER: Yeah. You said it would take effect in 60 to 90 days if they want to issue a building permit before then, what do they do?

MS. HESCHONG: They would have to follow their normal procedures. If they were trying -- they would have procedures for zoning ordinances. And if they have a variance for the normal zoning ordinance, I'm sure that they have standard procedures to deal with that, if they need to issue a building permit before the zoning is changed.

MR. TRIMBERGER: Okay, so we aren't looking at a variance procedure that, you know, we're not saying that we want to take this whole one block and move it in, but, you know, we've got somebody that wants to put up a retail establishment and he wants more signs, maybe. More signs, outdoor lighting, whatever.

And he wants to move up a zone. Now, they can -- the planning commission can declare a

variance for that parcel. Does that mean that that parcel has to come and be reported to the Energy Commission? Or just a modification to the zone?

Is that variance procedure, is that what we're talking to be a modification to a zone?

MS. HESCHONG: The way it is currently envisioned is that local jurisdictions would modify lighting zones according to census blocks. So that they are in the same granularity as they are in the U.S. census mapping.

MR. TRIMBERGER: Okay. Thanks, I think that handles it. Great.

MR. FLAMM: John.

MR. HOGAN: John Hogan, City of Seattle. Seattle and Washington State have had exterior lighting requirements which we've been enforcing for 22 years now, since 1980. And we'd like to share some of our experiences with you today.

In regards to this particular topic I'd like to make one comment on the material on page 10 which talks about amending the lighting zone designation. I think we're just talking about that.

The next-to-last sentence says: a

lighting zone may be increased or decreased by one zone. I would recommend that you modify that to say it may be increased by one zone, but it may be decreased by any of a number of zones.

I think at the previous workshop I expressed our concerns about the complexity of having multiple zones. But if you're going to multiple zones, within the City of Seattle we have an arboretum, which is a natural area, so obviously it's an urban area which is a zone three, but we have some what we would call zone one within that.

The City of Portland, the entire west hills are a hugh, it's within the urban area, but they call it a wilderness park. And so it seems in other cities there are going to be places where people are going to want to use the zone one designation.

So I'd encourage you to allow that flexibility. Thank you.

MR. FLAMM: Thank you. Additional comments on this section? Jack.

MR. SALES: Jack Sales, International Dark Sky Association. And, of course, we support the use of lighting zones.

However, I kind of looked at zone one as the statement is state parks and recreation areas. And I find that even though it's allowed in zone two to drop down to zone one, I would like to see a statement somewhat to the effect of some rural areas.

We see a lot of rural areas that are really intrinsic dark, and that's the original wording there, so I would kind of like to extend that zone one to soften the differences, I guess.

Thank you.

MR. FLAMM: Thank you. Okay, then I would like to proceed to the next presentation. I believe Jim Benya is online. Are you there, Jim?

MR. BENYA: I'm here.

MR. FLAMM: Okay. Jim is in -- it's Florida, right?

MR. BENYA: No, I'm in South Carolina --

MR. FLAMM: Oh, South Carolina.

MR. BENYA: -- at the moment.

MR. FLAMM: Sorry. And so for Jim Nancy Clanton will be making the presentation, and Jim will be there to answer any of the hard questions that may come up afterwards.

So, Nancy.

MS. CLANTON: Thank you. I'm Nancy Clanton with Clanton Associates. And this particular measure is point of sales canopy.

Next slide. The description for this is specifically outdoor sales areas that are under canopies. The lighting power density maximum, again, will vary depending on the four different lighting zones as Lisa described them. And by classification. We have separated out service stations from other general uses.

Next slide. The design criteria is from the IESNA Ninth Edition Handbook. As I refer to it, the blue section, which is the quality and visual environment in the lighting design guide. And in there, and also within the handbook, itself, in the chapter under retail lighting, the illuminance levels listed are in both of these areas, which is described in the measure as it's written.

But, in kind of a summary, lighting zone one, we have used it for a dark surround, which is the description in the handbook. And lighting zone two would be the light surround. And then lighting zone three is two times the lighting zone two numbers. And then lighting zone four would be

two times the lighting zone three numbers.

Throughout the handbook and throughout the different recommended practices you will realize like what Charles said earlier, we made our best attempt to take the recommended levels that was in the handbook and then the recommended practices and apply them to the different lighting zones. And in this case we actually went a little bit further in order to allow, I guess, more light than what was published.

Next slide. This is design criteria decision. And I'm sorry, I'm having trouble reading this.

(Off-the-record discussion.)

MS. CLANTON: In the gas sales basically is allowed in lighting zone one, though other outdoor sales area is not allowed. We're just waiting to see if we can get the comment erased.

I'll keep going. Let's go back to that other side. We have got, again, four gas stations in particular. Lighting zone one is going to be five footcandles, which is the IESNA recommendation for dark surround.

For two, it's ten footcandles recommendation for light surround. Then we've got

for lighting zone three, 20 footcandles, which is two times the light surround recommendation. And lighting zone four, which is 40 footcandles, which is four times the light surround, or two times what lighting zone three would be.

Other retails is approximately 50 percent of the gas station, that type of lighting.

Next slide. In the observation it was looking at all the different types of lighting zones, and similar to what Charles mentioned in the preamble, that it looked as if the different recommendations in illuminance levels appear to follow two times the illuminance levels in the different categories whenever we looked through the IESNA.

This, of course, did not follow through completely because every single recommended practice is designed and created by different committees. But, with this rationale we found it pretty consistent that we could go two times level when we're going from one zone to another.

And again, the current standards only talk about dark and light surround, so we've had to extrapolate that information into lighting zone one and lighting zone four.

Next slide. And there is an example of, you know, many of us did not know that there would be service stations in lighting zone one, and yet there is in some of the national parks. They will have service stations there.

Next slide. The equipment used specifically are going to be metal halide -- at least, this equipment for the models only, we're not specifying the different lamp sources, except for from an efficacy. But for the models the design team had to decide what equipment would be used.

And for gas station canopies, as you can see, a metal halide lamp, pulse start horizontal burn position was used. And in the calculations we used the mean lumens. And just a standard CWA ballast. The luminaires used are recessed luminaires and they have a flat lens on them, so they do not project below the canopy.

In addition to that, a light loss factor of .7 was used, which is in addition to the mean lumens. And then the next slide will show the locations.

Next slide. The actual model that was set up. This model was set up in lumen micro.

Next slide. And there it is. It's the software that was used.

Now, what the model has done is that it was slightly exceeded the criteria to make sure that LPDs would be generous, I guess is the best way to put it.

Next slide. And here are the calculation results. And this particular model modeled 20 footcandles, which would be the LZ3 level.

Next slide. So the recommendations are to do LPD maximums in each lighting zone. And also controls for the LPDs or the different lighting zones are also included, similar to what Charles mentioned; 50 percent reduction at the end of business.

Next slide. And here are the actual lighting allowed power densities for the different lighting zones. And, again, this is very difficult for me to read, so I hope you all have a copy of it. My contacts are not working well today.

Next slide. So for the controls, the basic controls is that you have to have some photosensors on so that all the lighting is turned

off during the daylight hours. And then again, additional controls for after business use. And then all luminaires greater than 100 watts need to be IES cutoff type, or full cutoff. The least restrictive would be the cutoff type.

Okay, that's the end of the presentation. And I guess Jim is on the phone to answer any particular questions you may have.

MR. FLAMM: Okay, would you bring the lights up, please. Questions or comments, please. John.

MR. HOGAN: John Hogan, City of Seattle. The lighting power allowance that we have in the Seattle energy code for gas station canopies is 1.0 watts/square foot. This falls between your lighting zone two and lighting zone three values. So it seems comparable to what we've seen in Seattle.

Thank you.

MR. FLAMM: Thank you. Mr. Trimberger.

MR. TRIMBERGER: Representing California Building Officials. What's the definition of a vehicle service station -- other vehicle service station versus a retail gas and service station?

MR. FLAMM: Jim, are you there?

MR. BENYA: I'm here. I don't think we've actually tried to define that yet. I think we have an intuitive understanding of what that is, because I think the intent is in general -- let me back up and add two comments that relate to the presentation. Nancy, thank you for doing that, it was very good.

Two comments. Comment number one. Gas stations represent an unusual problem. We're extremely aware and conscious that the industry feels that security is tantamount, and we're also extremely aware of their feeling that the higher the light level the better. So we pay very close attention to that information.

We're also aware that IESNA RP2 and other documents may encourage higher light levels band book. We made a big exception in this case in ratcheting the concepts down into lighting zone one to give us the ability to have an extreme case of lighting zone four, lighting levels that are consistent with some of the brightest lighted gas stations in the most demanding urban environments today.

So we feel that we've done a good job of covering the spectra, and we did take that into

account.

That being said, we're also very concerned, however, about encouraging in the commercial sales activities in lighting zone one. And where a vehicle service is always going to be necessary, we sort of feel that we really want to take anything other than gas sales and push them up into lighting zones two, three and four, from the preservation issues that we've raised in previously.

So that's kind of the thinking about why they're different. And it's kind of the thinking about how we might define them better.

MR. FLAMM: Jim, I'm not sure if you answered Tom's question on the definition.

MR. TRIMBERGER: I didn't get it. You said you had an idea of what the intent was. You didn't have a definition but you had an idea for the intent. Could you explain that?

MR. BENYA: Well, again, I think I explained the intent is to minimize the -- let me back up. The primary intent is to recognize the unique and extreme security issues related to gasoline sales.

And we do understand that requires more

light. There's plenty of support from that industry. And the lighting levels that coincide with the power allowance for gas sales have, as a result, been increased by literally two times respectively by taking the course that we've taken.

I don't feel that that's appropriate for other types of service where you don't have the same related issues.

So, it is based primarily on the difference between point of sale gas service and other types of service gas.

MR. FLAMM: Thank you, Jim. I believe that's a definition that we're going to have to work out and have on a future published document. And Jim will help us work out with a definition on that.

MR. BENYA: No problem. By the way, those terms come directly from the IES handbook. We didn't dream them up out of nowhere. They're in the handbook.

MR. FLAMM: Thank you.

MR. ELEY: If I might clarify. If you read the report, Tom, I think we've just got gas stations and then other covered sales, which would

eliminate your question.

MR. TRIMBERGER: But we've made the expanding that the retail gas and service stations.

MR. ELEY: Well, no, I don't think that's the intent. I think we -- I'm not sure we can distinguish between different kinds of vehicle service stations.

MR. TRIMBERGER: Other vehicle service stations? I'm just trying to get an example. Is that somebody that, you know, sometimes service stations, gas stations go out of business and they re-use the space, you know, is that for doing smog work, or repair shops. Is that a flower shop.

MR. ELEY: What I'm saying is the intent is just to have retain gas stations and other. Just those two, basically.

MR. TRIMBERGER: Oh, okay.

MR. ELEY: The other would be flower marts or any other kind of outdoor sales under a canopy.

MR. TRIMBERGER: But you're in table 3, you show three.

MR. ELEY: This table is inconsistent with the report, though.

MR. FLAMM: Any other questions or comments? Dawn.

MS. DeGRAZIO: I'm Dawn DeGrazio, Sacramento Municipal Utility District. And under design criteria on page 35, and, Jim, you did address this a little bit, but it wasn't clear to me as I was reading this what the justifications were for some of the numbers in tables -- well, it's stated that the values for light surroundings are used for LZ3 from tables 26 and 27, the model for the calculations is based on this condition.

Well, in tables 26 and 27 from the IESNA they recommend 10 footcandles and five footcandles on the horizontal respectively for gas station pumps under a light surrounding condition.

So, I'm wondering why then is 20 footcandles chosen for the LZ3 condition if it's based on the IESNA recommendation for light surroundings as a target for that model.

Second question is on controls, table 30 on page 39. The LZ3 and LZ4 lighting systems don't have to be extinguished, or at least reduced to 50 percent upon close of business. And I'm wondering what's the rationale for them being allowed to just stay open at the highest light

levels all night long.

MR. BENYA: Okay, well, let me answer the first one first. In the first case, and I'm not in the perfect situation to be able to quote chapter and verse, so allow me a little leeway here.

But, in general, as we were going through the process of checking and writing and rewriting, it suddenly dawned on me at one point that what we really were trying to accomplish with this particular set of issues was what was expressed in the slides Nancy just showed.

And one of them in particular was the issue related to, principally the issues especially related to, you know, getting the gas station into the LZ1. I had previously not really felt that LZ1 was appropriate for gas stations. But after having reconsidered it, I came to the conclusion, yeah, I guess we better deal with that.

So, we shoved the case of gas stations, everything down one category. What I did is I took the dark surround, which is 5 footcandles in LZ1; the light surrounds in LZ2. And that left us with LZ3 and LZ4. And we simply applied the logic

then that exists in the IES recommendations. That LZ3, LZ4, you just step up an LZ, about a doubling of the light.

Does that explain --

MR. FLAMM: Dawn is shaking her head yes.

MR. BENYA: Okay. And as far as the controls are concerned, that's a very interesting question, because we debated the issue about whether, you know, how controls might or might not be done for each one of these.

And I personally think that lighting for gas service stations, particularly in LZ -- the higher LZs, certainly you're talking about areas where one of the primary reasons, again, we made that fundamental change compared to everything else was because of the concerns about security.

So, we're expecting that security, even in a locked up facility, would probably require some significant amount of light due to what goes on there. So, you know, we're assuming that 50 percent is a reasonable allowance for security when the place is locked up and you're not dealing with that much problem.

Does that answer your question, Dawn?

MS. DeGRAZIO: Well, actually what you said does, but what it says in table 30 is that they're missing, actually there are missing asterisks. There are asterisks on the values for LZ1 and LZ2, and the note says with the asterisk, must be extinguished upon close of business.

LZ3 and LZ4 don't have that. But they don't have anything that says they have to be reduced to 50 percent, either. There's nothing indicated in this particular measure that says that they have to be taken down to 50 percent.

MR. BENYA: Okay, well, I'm going to throw this one back to Charles, as our team leader, to just make sure we picked it up and get it correct in the next posting.

MR. ELEY: Actually there's some conflicts between the slide in table 30, anyway, I think. So table 30 numbers that we're recommending here are not what's shown on this slide.

MR. FLAMM: Mazi, and then this gentleman right here.

MR. SHIRAKH: Just one comment under controls is we are only, since this is done through building permitting and Title 24, the only

thing we can ask the building officials do is to make sure that the control equipment is there. We're not going to be enforcing any permitting. We're not going to have building officials going around writing people up.

Basically all they're going to do is at the time of permitting they're going to make sure that the control equipment that's required by the lighting zone is actually there.

So I just wanted to make clear that we're not enforcing curfews.

MR. FLAMM: Sir.

MR. GUTELL: Thank you. My name's Mitch Gutell; I'm with bp ARCO. I did want to ask a few questions or at least put in some in the form of questions.

One of the issues, in terms of since you were just talking about hours of operation, you talk about closing down the lighting at 2:00 in the morning. How about for a 24-hour operation? Will we be required to shut off our lights at 2:00 in the morning and operate completely dark? So, I think an allowance needs to be created for that.

The other thing is this idea of a five footcandle forecourt or a five footcandle maximum

in a zone one and a ten footcandle in zone two. I think a ten footcandle is you're getting down to the point where it's almost not safe.

For example, we know that people traveling at night in areas like this that might be rural areas might have kids in the car; the kids all went to get out of the car. Is it safe for other vehicles to be moving around when there's people in the forecourt? And at ten footcandles can you really safely see what you're doing?

You're also operating a fuel pump which can be hazardous. People need to be able to see what they're doing. So I would really think that what we need to do is incorporate a minimum safe standard. And I haven't seen anything that shows that we've looked at this from a safety standpoint.

Obviously from a security standpoint having just enough light to attract business, but not enough light to really see faces and identify colors and identify characters is a detriment to security.

We have security cameras and so forth, but they need a certain amount of light to

operate, too. So, a minimum standard there would probably be a good idea.

Another thing is that the state fire marshals generally require that there be some kind of supervision on the fueling area. And the way that's achieved is that the cashier inside of a building can see out to the fueling area.

If the fueling area is very dark with respect to the lights that are inside the building, and the building becomes a fishbowl then the cashier cannot see outside. So that becomes a safety issue. It also becomes a compliance issue with local codes. If the cashier can't see outside at night, then basically we can't do business. We can't do it safely.

So, I don't know if you want to respond to my questions or just enter them into --

MR. FLAMM: Okay, we'll have Mazi make a comment and then Jim, if you have any comments. And then I'll recognize the other gentleman.

MR. SHIRAKH: Just a couple points again under controls. We're not going to be enforcing any curfews, we're just going to require the controls to be there should somebody choose, like if we have another energy crisis or a local

jurisdiction wants to enforce some kind of curfew, it would be up that. We, at the state, are not going to enforce curfews.

As far as security lighting and the 10 footcandles, I have a light meter in front of me right here and it's measuring 12 footcandles. And, you know, it's sufficient light. So, I don't know if it's a problem for security to have ten footcandles. There's sufficient light here.

MR. GUTELL: Is that ten footcandles -- when we say ten footcandles, is that a maximum or just a mean across the entire area?

MR. SHIRAKH: I'll let Jim answer that.

MR. GUTELL: Okay.

MR. BENYA: I might also want to add that this is a power density standard, it's not a footcandle standard.

Your designers of your facilities are still free to use the power in the manner that they wish so that they can put 20 or 30 or 40 footcandles at key locations and lots of other locations.

So, you know, you're not required for so many footcandles, you're simply just limited to the number of watts per square foot that shown in

the standard.

MS. HESCHONG: I would like to expand on that comment, that since it's a lighting power density standard we are using the footcandle levels as a mean design criteria, but, again, your operators are also encouraged to use higher efficiency equipment and higher efficiency design techniques that would result in higher illumination levels for the same efficiency.

That is always an option. So, we're not controlling illumination levels.

MR. GUTELL: Okay, I guess what's disturbing is -- or at least confusing to me, is that the standards that were just shown were in footcandles and so, if I understand what's going on, if I understand what the methodology is, is that here's an acceptable footcandle, now here's an acceptable technology, so therefore you derive the watts per square foot which is lighting power density based on an acceptable minimum footcandle reading.

So this is why I'm questioning the footcandle readings. I understand that if you give me a 1.25 or almost 2 watts per square foot that I have a certain amount of latitude in that

to come up with the technology I want to use. Is that --

MR. BENYA: You do, as a matter of fact if you use more efficient technology than we use for the basis of this standard, which by the way, the -- lamps -- you will find that we actually have, you can use a more efficient technology and achieve higher light levels. That's always been available as part of the standard.

MR. GUTELL: Okay, one more question if I may. The watts is connected load, correct? We are experimenting with a device called WattMan, i don't know if anyone is familiar with that. Basically it's an auto transformer system that reduces the wattage of a fixture, high intensity discharge type fixtures.

We're using pulse start metal halides on our forecourt or our fueling area. And what that does is if you have a 320 watt light, it arcs up and it runs at normal voltage for about 18 minutes, I believe the number is.

And then after 18 minutes it reduces the voltage on the light down to about 100, maybe 95 volts. Reduces the wattage quite a bit but it doesn't have an appreciable effect on the lumens

that that light is putting out.

So, is my wattage going to be based on the connected 320, or is it going to be based on the 320 minus the, you know, the 20 percent or 25 percent savings? So, in other words, the effective wattage is actually down about 290 or 280 or something? Or even less than that.

MR. BENYA: Well, I'll tell you what, Nancy or -- want to take that? I've got to deal with running through airport security. I'll call back.

(Laughter.)

MR. GUTELL: My sympathies.

(Laughter.)

MR. GUTELL: Really.

MR. ELEY: In general when you calculate the connected watts you look at the maintained watts, so if there's additional power that's required for startup that's not factored in. But we'd have to look at this technology. Sounds very interesting.

MR. GUTELL: We're using it, and if you would like, my card is out there, and I can tell you how it's working at our stores.

MR. ELEY: But, in general, I mean we

would look at the maintained watts after the --

MR. GUTELL: Okay, so it would be the effective wattage, not the connected wattage?

MR. ELEY: Right. So that's the wattage you'd be looking at in complying with the standard.

MR. GUTELL: Very good, thank you.

MR. FLAMM: Additional comments or questions? Nancy, you have something, and then --

MS. CLANTON: Well, one comment that the gentleman made was on the illumination levels, and whether 10 footcandles was safe or secure for a gas station.

And the comment I would have is that ten footcandles is really a lot of light. And the most important thing is that when we are transitioning from the roadways to the gas stations, it's very important that you don't overlight, because then we have some adaptation problems as the public leaves the service station and goes back onto the roadways.

And there has been quite a bit of research done on adaptation and that whole problem of transient adaptation; and also if you're in the service station for a minute that you could have

problems in re-entering the roadway.

So, in the recommendation there's several places where it says that you should not go beyond your surround in a service station and exceed 20 to 1 in any case because of this adaptation problem.

And the roadways will be lighting somewhere in an urban area between a half a footcandle and one footcandle. So it's very important not to exceed that limit or you could have some liability problems.

MS. HESCHONG: Let me point out that's the IES recommendation design approach. That's not the CEC standards.

(Parties speaking simultaneously.)

MR. FLAMM: Sir, you need to -- if you would go to a microphone?

MR. PENNINGTON: We'd like to have your comment, why don't you come --

MR. GUTELL: Okay, I didn't want to get in a dialogue, but again, the concern is the safety on the forecourt. As far as the vehicle moving back on the road, in essence the forecourt isn't right on the road, so they move into a dark area before they move into traffic. It's a safety

issue. And I agree that we need to take that into consideration.

But the other issue is the visibility of the fueling area from the store. And, you know, we would hope a number of people would go into the store, that's a brightly lit area, too. So, again, the transition comes in. They come out.

I'm not saying that we always have to have 20 footcandles, but something above ten I think would be reasonable.

MR. BENYA: Hello.

MR. FLAMM: Hello, Jim. Welcome back.

MR. GUTELL: Did you get through security?

MR. FLAMM: Did you have a comment, Jim? If not, I have another gentleman waiting at the podium.

MR. BENYA: No, please, go ahead.

MR. FLAMM: Sir.

DR. CLAUS: Robert Claus. There is no question that this is a zoning action. I have grave doubts this complies with the California enabling statutes. And I doubt you understand how deep this water is once you get off into this change of zoning.

But I would just add several things to you. That in this society it's easy to pick a target light gas stations that's indicative of what you're trying to do.

When, in fact, the pejorative language gas station, and then you lead to this, doesn't make any sense. Because right now service stations are car wash, fast service food. And in fact, if you get to the lower end of the value oriented motel they will have exactly many of the same conveniences for the consumer.

What I'd like to know, and just take on page 35, where you got these standard zoning definitions where you compare the gas stations, service stations and food stands. Whoever wrote this, who came up with these? Are these just conjured out of somebody's big brain? Or is there something those of us in the industry need to go look at?

Because I don't understand your categorization. I think it's arbitrary -- it's clearly arbitrary. Whether it's discriminatory or not is an open question. And I don't know how you can suggest a fast food where 60 percent of their people stay in their car, actually never leave the

car in the typical fast service food. And they go under canopy-like structures. Why the distinction?

I mean it's not treated that way anyplace else. So I guess we're inventing zoning again. Can you tell me what the --

MR. ELEY: Well, these requirements that you reference are from the IESNA handbook.

DR. CLAUS: They may be requirements from the handbook, but you're going one step further. You're turning them into regulation of those uses by zone and type.

Now, you can talk about taking something out of an illumination handbook, and when you turn that into zoning, and then you turn back into a distinct sole use, when you've got similar uses, I'd like to know how and why this receives the special umbrage, particularly using the word gas station. That's particularly inappropriate. They're service stations, they're mixed uses in order to hold the prices down to the consumer.

It's like starting and calling signs in general a nuisance with lighting, and now we have gas stations, we don't have service stations. I mean I understand where you pulled it, I

understand where you're going. I understand the motive behind it. I think anybody who reads it does.

But I'd still like to know beyond the handbook where you pulled out service stations what standard zoning reference you're using for this categorization.

I mean, is that a tricky question? I guess it must be. Thank you.

MR. FLAMM: Thank you. Mr. Fernstrom.

MR. FERNSTROM: I have a comment on Charles' interpretation that lighting power should be the mean power after the system is in operation. And I think that interpretation is appropriate if you have a fixed type controller where a system, for example, might have a ballast factor.

But if the dimming system and the mean lighting power is user-adjustable, I think that we have to question whether or not using a user-adjustable figure would be appropriate for not for the standard.

MR. FLAMM: Okay, thank you. Additional questions or comments for this? Sir.

MR. ABRAMS: I'm Jim Abrams with the

California Hotel and Lodging Association. And also here representing the California Restaurant Association.

And I appreciate that the comment I'm about to make really falls into a variety of areas that will be covered by your agenda today, and I won't get up and keep repeating that.

One of the real challenges that we faced the last time the Commission went through the whole issue of nonresidential standards and what kind of lighting to allow is to come up with an agreed upon measure of security related lighting. I appreciate you're dealing with that today with outdoor lighting.

But the comment that you made is 12 footcandles here, is that enough or isn't it. To our knowledge nobody has really ever fixed on an acceptable level with respect to security. And while we're not worried so much about the sales canopy areas, point of sale canopy area, it gets into everything we do, whether it's indoor or outdoor, or whether it's walkways, parking garages.

And one of the things I will attempt to do as part of your process, I see you're going to

have another meeting later on this summer, perhaps, as your tentative schedule, is to see from some security experts if we can come up with some recommended, I'll call it a standard for lack of a better term, but some recommended minimums for security in different kinds of situations.

The vast majority of claims that are made against lodging establishments either for slip and fall, but particularly criminal activity, outdoor always deal with the question of adequate or inadequate lighting. That's always the claim that's made.

And I want to just raise the issue with you. I know you don't have any final answers today. And we're going to try and provide some information for you. But as you go through all of these things, outdoor sales lighting, all of these kinds of things get involved in the lodging industry and the restaurant industry that operate 24 hours a day.

And it is probably one of the greatest concerns we have with the whole issue of outdoor lighting. Thank you.

MR. FLAMM: Thank you.

MR. BENYA: Could I address that real

quickly. The gentleman raises, you know, a point we expected and spent a lot of time discussing at this meeting and others.

He's absolutely right, there's a minimum of documentation to support absolute numbers in the area of security that's appropriate for lighting.

The reason why we use the IESNA lighting handbook is because the IESNA lighting handbook -- first of all the IESNA is the only American National Standard Institute's -- American standards writing body that deals with illumination. And it does have security lighting committee; it does have security lighting considered throughout all of its documents, including the handbook that we used to develop these values.

We believe, and we have good reason to believe that security is, to a large extent, implicit in those values. That said, we're always willing to take a good look at any reasonable research that suggests that those values are correct and consider it as part of our work.

We've already -- to demonstrate that degree of thoughtfulness in this particular

standard, and certainly you're welcome to bring -- as soon as possible. We'll take a look at it, be glad to dialogue with you on it.

MR. ABRAMS: Thank you. And we're not necessarily arguing the recommendations you're making are inadequate. But just that we keep trying, everybody keeps trying to struggle, the lawyers, the courts as well as the design professionals and the engineers, what is, quote, adequate security. And that's the challenge. And we will help in any way we can in that regard.

MR. BENYA: I understand. And in my practice I've been involved in working for the gaming industry as well as the retail industry, shopping center industry, et cetera. I understand your concerns. But, I think we've addressed them, but we're more than willing to stay in touch and follow up as much as we can.

MR. ABRAMS: Thank you.

MR. FLAMM: Thank you. Any additional comments or question with this element?

Okay, with that I'd like to move on to the next presentation. And you all get to go to lunch after this one. It's outdoor sales lighting, and Nancy will present that, also.

MS. CLANTON: Yeah, Nancy Clanton with Clanton and Associates, presenting for Jim Benya.

Next slide. The description for this is basically outdoor sales that are not underneath canopies. And there is an emphasis on auto sales with this particular measure.

Like the other measure, the OPD maximums will vary depending on the four lighting zones. And by classification. Auto sales versus general uses.

Next slide. The design criteria used for this particular measure for the models was in the IES lighting handbook ninth edition, in a similar place as the other measure, which is the lighting design guide.

And under this particular measure in LZ1 lighting for outdoor retail lighting or sales is not permitted. In LZ2 the criteria will be in dark surround. LZ3, light surround. And LZ4 is two times the LZ3.

Next slide. In the design criteria decisions basically we looked at outdoor lighting sales not under canopies as not appropriate for LZ1. And security lighting is an issue in certain locations.

For auto sales specifically LZ1, auto sales are not permitted, or at least the lighting for it in LZ1. In LZ2, ten footcandles, which is the IESNA definition for secondary or town. In LZ3, 20 footcandles was used in the models, which is IESNA definition for competitive or the city environment. And then LZ4 is two times the lighting zone for LZ3.

And all other retail is 50 percent of what is allowed in the auto sales.

In some of the observations the values again for exterior lighting look like it was about two times the value in going from one zone to another. The IESNA current standards are limited to primary and secondary markets. An extrapolation of these values into LZ4 may be accomplished by using, again, that power of two, taking the lighting zones from, or the values from LZ3 and multiplying by two.

The equipment used for the models in particular again uses the metal halide technology. Once again using mean lumens in the calculation with CWA ballasts. The luminaires used specifically for the auto sales is a forward throw cutoff metal halide luminaire. And the light loss

factor used in the calculations is .7. And there's a picture of the luminaire.

And in the models, themselves, this is just kind of a description of the different types of -- put into the auto lot. With the front row of cars, five to ten feet back from the front row of lights.

For the calculation, next slide, once again light technologies LumenMicro2000 software was used. And the design was accomplished to slightly exceed the criteria listed in IES. And in the calculation results there are, in the auto sales lot, five to 15 footcandles in the lot, itself. And in the front row of cars we have 15 to 25 footcandles.

The calculation results, next slide, yeah, that's right, you have a grid of 400 watt luminaires and they're producing 10 footcandles average, which equates to about .5 watts per square foot.

The front row illumination has additional 400 watt luminaires along the frontage, and it produces 20 footcandles in a zone at about 3.5 watts per square foot -- 35 watts per square -- per linear foot.

MR. ELEY: Per linear foot.

MS. CLANTON: Per linear foot. And this model represented lighting zone 3. So, the recommendations are is that the LPD maximums in each lighting zone are established; that there are requirements for lighting controls, maximum power densities and shielding of luminaires. And that the requirements are expressed by lighting zones.

Next slide. And this is a chart showing the specific sales area, the lighting zones. You have sales of vehicle sales and then all other outdoor retail.

And notice that lighting zone 1 that lighting for these particular uses are not allowed.

Next slide. Then lighting allowed power for the -- frontage, this is on a linear foot basis, which would take the front row of cars and the linear footage of that. And a separate lighting power density is established for these. Again, noting that lighting zone 1 does not allow lighting for this particular use.

Next slide. In controls and shielding, once again the photosensors are used to turn off the lights during daylight hours. And also all

luminaires greater than 100 watts to be either IES cutoff or full cutoff luminaires.

MR. FLAMM: Thank you, Nancy. Turn the lights up, please. Any questions or comments, please? Mr. Hogan.

MR. HOGAN: John Hogan, City of Seattle. The 0.5 watts per square foot which you have for zone 3 is the same requirement which we have in effect in Seattle. So we think that's a good value.

We do not have an additional allowance for auto frontage, and so I would question whether you need to include that. Or if you did include that, whether that becomes a use it or lose it type of value.

People think about auto lots and you think about these shiny new cars. There's lots of used car lots. And our experience in Seattle is that those are not lit so highly. We see those -- watts per square foot without any -- so it's not clear that we need that, certainly for the used car lots.

MR. FLAMM: Jim, the loudspeaker where you are is coming over our workshop here.

MR. BENYA: Sorry, I was actually trying

to muffle the loudspeaker, the microphone, and it's just they're really loud.

MR. ELEY: Just for clarification, it is their intent that that front row allowance is a use it or lose it allowance. You can't trade that off with other outdoor lighting.

MR. FLAMM: Okay, Mr. Trimberger.

MR. TRIMBERGER: Tom Trimberger representing CALBO, again. Now, I'm looking at these, these are prescriptive measures, it says you have to do this. Is there anything in the standards that says we can tradeoff if we build a building and save some energy there, do a performance approach, and use a little more light here? Is there that flexibility built in?

MR. ELEY: We're not proposing that there be tradeoffs between outdoor lighting and interior lighting. Many of the lighting -- Jim, you need to mute your phone.

You can have tradeoffs between many of the outdoor lighting applications, but some of them are designated as use it or lose it allowances.

MR. FLAMM: Mazi.

MR. SHIRAKH: Part of the reason we

don't allow tradeoff between conditioned space and outdoor lighting is because you look at our LPD values for outdoor lighting, they are very low. So it wouldn't take a whole lot of tradeoffs to make the outdoor lighting really bright and defeat the purpose of what we're trying to do.

So, for those reasons we decided the tradeoffs would be limited to outdoor lighting applications where use it or lose it type situation don't apply.

MR. PENNINGTON: There is an intent to have the tradeoffs allowed across lighting functions, the outdoor lighting functions.

MR. TRIMBERGER: So you can trade off one outdoor function for another outdoor function?

MR. PENNINGTON: Right.

MR. TRIMBERGER: And that would have to be modeled with an ACM of some type?

MR. PENNINGTON: It's a simple calculation.

MR. ELEY: Well, it would just be like trading off lighting between one room and another indoors. You wouldn't have to use a simulation tool or anything. You just --

MR. SHIRAKH: You would come up with a

total budget for the permitted space, just like indoor. And then --

MR. TRIMBERGER: Based on square footage or whatever?

MR. SHIRAKH: -- you can use it any way you want.

MR. FLAMM: Okay, Mr. Fernstrom.

MR. FERNSTROM: Point of clarification. The front row lighting power density in watts per foot is additive to the area in watts per square foot, is that correct?

MR. ELEY: That is correct, yes. So the total -- but that front row is a use it or lose it allowance, just for the display purposes of that front row of vehicles, or the front row of whatever the outdoor sales is. It could be tomatoes or whatever.

MR. FERNSTROM: So if one had a very shallow lot the effective watts per square foot might be higher?

MR. ELEY: They would indeed, yes.

MR. FERNSTROM: Thank you.

MR. BENYA: Actually, on the effective watts per square foot it would be higher, the illumination recommendation of the IES can be

achieved in either event, Gary.

MR. FERNSTROM: Thank you, Jim.

MR. BENYA: -- per square foot, yes.

MR. SHIRAKH: I just wanted to add one more thing, Tom, that the concepts we're developing here we've tried very hard to make it as much similar to indoor lighting as possible, as far as LPDs and tradeoffs and controls.

So, you know, it's because it's understood by people out there and it's enforceable. And it's basically what we're doing is an extension of indoor lighting.

MR. FLAMM: Additional comments or questions? Okay, we're right on schedule. This afternoon I am going to shuffle the schedule a little bit. One of our presenters has an earlier flight to catch, so we are going to start up at 1:10 with parking lot lighting. And please do come back. Thank you.

(Whereupon, at 12:05 p.m., the workshop was adjourned, to reconvene at 1:10 p.m., this same day.)

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AFTERNOON SESSION

1:13 p.m.

MR. FLAMM: I've juggled the afternoon schedule a little bit to accommodate some of our travelers. So, rather than read it off, I'll just surprise you each time.

So, we're going to start with parking lot lighting, and Nancy Clanton is going to be making the presentation. Now Nancy is not our only presenter. It appears that way, but she's presenting for both herself and for Jim Benya, and so this is her thing now.

MS. CLANTON: So we'll go to parking lot lighting as soon as the screen comes up. Again, I'm Nancy Clanton of Clanton and Associates.

Next slide. The description of this is basically looking at establishing LPDs and control requirements for different parking areas. And again, the maximum LPD will vary depending on the four lighting zones. .04 for lighting zone 1 up to .2 for lighting zone 4.

In addition, the controls must be able to reduce lighting by at least 50 percent during curfew hours, besides being turned off during the daytime.

For lamps greater than 50 watts the efficacy must be greater than or equal to 60 lumens per watt. And, again, cutoff or full cutoff luminaires are required.

Next slide. The design criteria is based on IESNA RP20 98 lighting for parking facilities. This was selected because the group that is in charge of primarily for writing recommendations for parking facilities is with the roadway lighting committee. And the roadway lighting committee, this is a subcommittee of the roadway lighting committee that actually wrote RP20.

And the basic category that we used will represent typical parking lots and conditions of what RP20 uses.

There is only one other category that RP20 talks about, and that is enhanced security categories. And they define it as enhanced security is where personal security is a problem, or it is likely to be a problem. And so that is their definition.

Next slide. The design criteria basically states different types of illuminance levels, which is different than what we saw in the

retail area.

It talks about a minimum horizontal luminance or a footcandle. And where this minimum horizontal luminance is occurs within a standard grid of poles. And at the minimum horizontal point in the standard grid they also have a standard for a minimum vertical luminance at that same point.

And then they talk about the uniformity ratio, which is the maximum illuminance level to the minimum horizontal footcandle level.

Then again we looked at the different light design criteria and we used LZ2 for the basic parking lot criteria; LZ3 for the enhanced security. And because the roadway committee did not address any other areas, for LZ1 we took half of the level of LZ2; and for LZ4 we doubled the enhanced security lighting levels.

Next slide. And again I'm sure you can read this very well; I know I can't, off of the projector. But basically here are -- task lighting, and we can look at the different lighting levels, minimum horizontal footcandles for the different lighting zones.

And we have presented horizontal

illuminance levels; minimum vertical illuminance levels; and that's at five feet above the pavement as stated in the documentation.

And then also put down what the documentation in RP20 states for the uniformity ratios.

Next slide. The lighting equipment used for the models specifically for metal halide lamps, horizontal burn position, once again we used mean lumens, which is the middle of the road, or kind of end of life lumens. CWA standard ballast. The type of luminaires for parking lots specifically, we used IESNA type 5, which is kind of a symmetrical pattern; full cutoff distribution; light loss factor of .7.

And the poles that we looked at, different parking lot configurations, we looked at 20 foot, 25 foot, 30 and 35 foot poles. High. Thank you.

Next slide. The lighting models were based on typical parking lot dimensions. We wanted to make sure that whatever we recommended could actually be built. And the LPD is calculated based on the area assigned to each light pole.

Next slide. And here's a pictorial example of how the LPDs were calculated. And as you can see, it's a standard grid of poles that we would do our calculations in, which is exactly the procedure that is described in RP20 as far as calculation and for measurement.

And typically what you will find is that your maximum illuminance level is directly underneath the pole, especially with the horizontal burn lamp. And that your minimum value would be right in the center of a grid of four poles, and that's what we found.

Next slide. Here's the software that we used. We used lighting analyst AGI 32, version 1.5 software. This particular software is different than the LumenMicro because we are now in exterior spaces. And also when we get to other areas we will find that this particular software not only calculates illuminance, but also calculates luminance and small target visibility, which we found was very important to some of the other applications.

The initial design or models were based on some common pole heights, lamp wattages and pole spacing, based on standard practice.

Now, this is kind of how we went through it. Our initial criteria that we wanted to meet was the average illuminance. We felt that that was the most important. And then also to check that against the minimum vertical illuminance.

If we did not meet that with our pole spacing we started adjusting the lamp wattages and the spacing of the poles.

So if they were not met, then we started checking the uniformity and adjusting -- it's kind of a trial and error type of calculation -- in order to come up with the design that meets the criteria.

We found that the minimum vertical luminance is extremely hard to meet, especially under low light levels. Under LZ1. And yet we were able to meet it.

Next slide. And here's the calculation table which even I cannot read at .5 --

MR. ELEY: It's on page 21 --

MS. CLANTON: Thank you, page 21. And basically what this shows is what the standard criteria states and what our calculations actually showed that we used in order to come up with LPD.

Next slide. And with that we

established lighting power densities for the different lighting zones.

Next slide. And then in addition to that we had controls requirement. And we basically said in lighting zone 1 that during curfew hours all of the parking lot lights we assume will be on at 100 percent power.

But post curfew we would recommend that the lights are being turned down. And, again, as was stated many times, all we can do is to make sure that the controls are there to be able to reduce the power. You know, Mazi mentioned that you're not going to go around and check on whether lights are being turned off or on. But this is our recommendation.

And I think that is it. So I'll open it up for questions.

MR. FLAMM: Okay, turn the lights up, please. Comments or questions, please. Sir.

MR. ABRAMS: A series of questions more than anything. I'm looking at page 20, and the second paragraph below the diagram says at some point large parking lots will be able to skip a row of parking and only have lighting equipment in every other row.

And my question is to what extent, if any, is that assumption or that premise calculated into or factored into the numbers that you've just described?

MS. CLANTON: What that is, that's actually standard practice. That as the pole height increases you don't have to have the poles spaced so closely together. So if you have very short poles, like 15-foot poles, you may need a pole at every single row.

But as we increase the pole height like to 35-foot pole or 40-foot pole, you can actually skip rows. But then you would have a higher wattage lamp.

And so it basically is essentially the same, whether you have a lower wattage lamp and a shorter pole.

MR. ABRAMS: All right, so whatever you're allowed to do based on whatever other assumptions go into it, zoning requirements or anything else, you're going to be able to achieve the same level of lighting, in theory?

MS. CLANTON: Correct.

MR. ABRAMS: Okay.

MS. CLANTON: Right, that should not

affect the LPD.

MR. ABRAMS: And another question I have. This, again, goes to the security issue. And I think again a lot of this depends on being able just to analyze the numbers and understand them more fully than we've had a chance to do just yet, but I notice that lighting zone 1, which again would presume, as I understand it, a property or business establishment out in a rural area, in a campground, Yosemite where we have a number of hotels and places like that, I appreciate the fact that you've got a darker background.

Theoretically leads or practically leads to the conclusion that you might not need as much light. But again I'm worried that particularly in the areas where there isn't a lot of lighting around, where in an urban area at least, you know, there is a lot of lighting around, police can see what's going on.

And I'm worried about hotels, restaurants or other retail establishments that might be in a rural or in a LZ1 -- we've got to get another nomenclature for those who were in Vietnam, LZ is a bad --

(Laughter.)

MR. ABRAMS: -- but lighting zone 1, I'm worried with lighting zone 2, a lot of retail establishments, a lot of hotels, motels, restaurants in rural areas, bed and breakfast inns, and places like that, I'm concerned that this might create a real problem, again with respect to security.

And I don't have a good number to offer to you yet, but we're going to work on this. So I want to raise the concern more than anything. And just suggest that perhaps these numbers might need to be a bit more, just because you're out in the wilderness someplace doesn't mean that you haven't got a lot of security, safety, trip and fall kinds of situations that need some lighting.

And we need to look into it, ourselves, and provide you some useful information.

And then one other question. Do you -- I didn't see here that this really contemplates outdoor parking structures. Is that correct? Am I correct in my assumption? Is that covered someplace else in your --

MS. CLANTON: Unconditioned spaces.

MR. ABRAMS: Okay, so unconditioned

spaces including open sided parking structures. Okay.

MR. ELEY: Now, the parking on top of the roof would be covered by this standard.

MR. ABRAMS: Understood.

MS. CLANTON: Yes.

MR. ABRAMS: I'm talking more about the multilevel parking structure.

MR. FLAMM: Thank you. Mr. Fernstrom.

MR. FERNSTROM: And so those of us that were in Vietnam know that you need to have the LZ secure.

(Laughter.)

MR. FERNSTROM: Nancy, I have a question about the equipment you chose to use to translate the illumination levels into the lighting power specification.

There are three types of metal halide equipment that's available now, probe start or standard equipment with constant wattage, autotransformer ballasts; pulse start with pulse start ballasts; and now several manufacturers have introduced electronic ballasts for metal halide HID lamps.

So, given the good, better and best

nature of those three types of equipment, it looks like you selected only the good. And my question is why was not the middle of the road increasingly becoming standard technology pulse start used to do the translation?

MS. CLANTON: Okay, you're asking quite a few questions there. So first I'll go to the equipment, itself, the luminaires. We used the standard, hydraformed piece of equipment that is very common. It was not a segmented reflector, into a, you know, an excellent high performance optical performer.

We used kind of a, I don't want to call middle of the road, but it's just a very commonly used type of luminaire.

We did not use cobra heads, flat lens, because we felt that that was going too low in the optical performance. We actually did use an architectural type.

The lamp, itself, if it were 150 watts and below we did use electronic ballasts. And that is something that, you know, I'll be interested in hearing comments on that. And that's why the efficacies are higher.

But when we went to a 250 watt metal

halide we used the CWA ballast.

MR. FERNSTROM: Well, I guess I'd recommend pulse start technology because in terms of the lamp ballast system, that is a middle of the road. It's not the most advanced technology. It's not the worst in terms of efficiency. But I believe that that technology is merited for that application.

MS. CLANTON: The reason why we did not use pulse start, unless I'm incorrect I do not know of a pulse start, at least at the 250 watt, that is anything but a vertical burn position. And so we wanted horizontal burn. And so I could see the pulse start with the 150 watt and below, because we can get a horizontal burn.

But we wanted to use a full cutoff luminaire, and something that was standard. And I'm not aware that a vertical burn, flat lens is standard that most of the contractors would use.

MR. FERNSTROM: Okay, that's a good question to address. Thank you.

MS. CLANTON: Okay.

MR. FLAMM: Any more? Mr. Trimberger.

MR. TRIMBERGER: I'm not sure if I'm reading this quite right. In looking at design

criteria for parking lots, Sacramento County where I work, like a lot of counties and cities, has minimum lighting allowance, lighting requirement, for parking lots. One footcandle illumination per square foot is what they call for.

Is that -- and we get a photometric, point by point, to look and make sure that we maintain that through the whole space.

How does that correspond with the design criteria that you show in table 7?

MS. CLANTON: What we used, because a lot of municipalities have come up with their own criteria, and it's not well understood where that criteria came from and what scientific basis.

So what we did, we went back tot he standards writing body, IESNA, and used their ANSI approved procedure and method. And used their recommended values that, in the best professional practice, should be used.

We did talk about that some municipalities do have different lighting levels, but there really is no explanation where they came from and where they came up with those minimum values.

So, yes, ours are different than maybe

many of the municipalities, but it is based on standards.

MR. TRIMBERGER: Okay, I really wasn't looking for, you know, I'm just telling you as an example what mine is. How they got there I don't know. But does that correspond to a minimum horizontal illuminance? Or what is one footcandle per square foot on this table?

MS. CLANTON: What you're asking isn't a term, footcandle per square foot.

MR. TRIMBERGER: Well, what is a footcandle? Is a footcandle horizontal illuminance or is that something different.

MS. CLANTON: Well, no. What horizontal illuminance is is when you're measuring lighting, and Mazi has a light meter. If you put it down on a table, as Mazi is demonstrating, and the meter looks straight up, that is measuring the amount of light that comes down to a horizontal surface, which would be the pavement from all directions.

So every single light that contributes to the lighting level at that particular point.

And a vertical illuminance is taking that meter, now Mazi, turn it on a vertical surface at five feet up, it's kind of like where

someone's face would be, and it's in the cardinal directions of north, south, east and west.

And it's at the minimum horizontal point. You bring the meter up -- in your calculations and look at that. But it's all footcandles.

MR. ELEY: One thing, --

MR. TRIMBERGER: Are these measurements, are footcandles, then, correct?

MS. CLANTON: Yes, they are. They're in footcandles.

MR. ELEY: Which is lumens per square foot. But I might just note that these criteria that Nancy has here are minimums. So directly under the luminaire you're going to have maybe 20 times that amount of light.

MR. TRIMBERGER: Okay. But what we do now is we look at our photometric and say, okay, you're good except this one area here you're over here .8, and you need 1.

MS. CLANTON: Yeah, and so you are looking at minimum lighting levels, it sounds like. In other words you're saying in the whole lot you have to have at least a certain amount of light. And that's what this document, the

recommended practice, states.

MR. TRIMBERGER: Okay, but what I'm trying to figure out, and I don't know. What I'm looking at, these numbers here in table 7 are footcandles?

MS. CLANTON: Yes, they are.

MR. TRIMBERGER: So my guess then is that I can build parking lots if I'm in zone 4, or else I have to change my ordinance? Because minimum horizontal lumens I get .1, .2, .5 or 1.

MS. CLANTON: Correct.

MR. TRIMBERGER: So I'm in zone 4.

MS. CLANTON: It sounds like if your minimum horizontal illuminance, and again these are mean lumens with a light loss factor, so your illuminance criteria is at initial illuminance, initial footcandles as soon as you turn on the lights.

These have been built in. You've got to this value, and divided out the .7, and then also look at initial lumens versus mean lumens. So these are maintained.

MR. PENNINGTON: So what would that be in initial lumens or initial footcandles?

MS. CLANTON: Well, I'm not sure what

the initial lumen would be. I mean I don't have that at the top of my head. Whether it decreases by 25 percent, and then another 30 percent. So it's quite --

MS. HESCHONG: Roughly if you combined both the lumen depreciation from the lamp and the 70 percent loss factor you're at about 50 percent of mean lumens. So initial lumens would be close to double what these numbers are.

MR. ELEY: With metal halide, yes.

MS. HESCHONG: Just, yeah, very roughly they would be about double.

And that's a very good point because most standards, most recommendations are based on initial lumens and not mean lumens. And so it's a very easy point of confusion.

MR. PENNINGTON: So could we convert these to initial footcandles, I guess, is the --

MS. HESCHONG: By describing our assumptions those numbers can be backed out. The reason that we are using mean lumens is it makes for a much more equitable comparison between technologies, because technologies vary enormously by their lumen depreciation at a time.

And what the Energy Commission is

concerned with is energy use over time, not on the first day that you turn on the lights.

MR. PENNINGTON: But to clarify this issue for jurisdictions who have initial footcandle criteria it seems like we should put it in those terms so they can judge whether --

MS. HESCHONG: We can put that in the guidelines. Translations to help people understand the difference.

MS. CLANTON: And the other reason why we want to use mean lumens and a light loss factor, we did want to compare it against the PIER data that we were getting, which is all existing information. And so we wanted something as equitable with all the research data.

MR. SHIRAKH: Again, this is in line with out indoor models where we used mean lumens at 40 percent life.

MR. FLAMM: We only have time for a couple more comments. We're already losing time on our schedule, so --

MS. DAVIS: I'm Leslie Davis with Auerback and Glasow, Lighting Consultant in San Francisco.

I have two comments for clarification

primarily. The efficacy criteria stated that lamps greater than 100 watts shall have an efficiency or efficacy of 60 lumens per watt or greater.

The lamps that you used for modeling listed on page 18 show efficacies 54 lumens per watt for the 150 watt, and 44 lumens per watt or mean lumens per watt for the 250 watt.

So, could you clarify, is the 60 lumens per watt mean lumens per watt? Were you being generous with us so that we could meet the criteria using improved technology? And it would be helpful if a clarification was stated in the report, so that the lighting geeks, like myself, would not have to ask you questions.

MR. ELEY: The existing requirement, Leslie, is lamp lumens divided by lamp watts; doesn't even include the ballast.

MS. DAVIS: Okay.

MR. ELEY: So it is additional. That's the requirement that's in there now. Now, we've got to reconcile these, and we've got to agree on one or the other and stick with it.

Right now, --

MS. DAVIS: Okay, so the one is lamp --

MR. ELEY: Right now we're kind of talking initial lumens for some things and mean lumens for others. And we have to clarify that.

MS. DAVIS: So one's a lamp efficacy and one's a system efficacy.

MR. ELEY: Yeah.

MS. DAVIS: Okay. Also on your controls area, part of the standard is both lighting level, illuminance both in horizontal and vertical, and then uniformity, which is excellent.

But to reduce the light level by 50 percent it doesn't say anything in terms of the jurisdiction to the uniformity -- to have a uniformity requirement.

So I know you state in your comments that it would be good to have high/low ballasts. I'm concerned in areas like parking lots and building grounds where security is important, that if someone can meet the criteria by turning off half of the light sources, and my car is parked under the pole that's turned off, then there's a question about security.

So, similar to the indoor title 24, we started out with a criteria to be able to reduce the light level by one-half, and later it was

revised to reduce the light level by one-half uniformly throughout the space.

So is that something that you're considering as part of the legislation, and can that be enforced in the outdoor environment?

MR. FLAMM: Somebody like to comment on that?

MR. SHIRAKH: On the question of uniformity we could look at that. And, again, you were correct in mentioning that for indoor space as when we require bilevel switching, we have language in there that requires reasonable uniform reduction in there by switching off every other lamp or fixture. We could have similar.

And since these are going into title 24 anyways, all the existing bilevel switching requirement will apply on this to make exceptions to it.

MR. FLAMM: Okay, Gary, one moment. That will be the last one, if I could, so I can keep this moving. Anybody that has some wisdom to give to us, and you do not get a chance to express that today, I encourage you to send something to me, either email or in writing.

But I'd like to get us out of here

tonight at a reasonable time, so Gary, and then Dawn. Okay, Gary and then Dawn.

MR. FERNSTROM: Charles, you talked about mean efficacy versus initial. Surely the CEC's consultants are going to recommend system mean efficacy, because not all ballasts are created equal. And they have a significant effect on the energy efficiency of the system.

That's a question, not a statement.

(Laughter.)

MR. ELEY: Sounds like a comment to me.

(Laughter.)

MR. ELEY: The current requirement is written the way it is so that it's easy to enforce. And when we set the 60 lumens per watt number we wanted to be really easy so that you could just look at the lamp books and determine that you were or were not there.

And it basically drew the line between fluorescent and metal halide HSP on the passing side. And mercury vapor and incandescents on the failing side. And that's really all the current requirement does.

Now that we're actually developing the standard for outdoor lighting more than just

efficacy, I think we probably will be looking at that system, lumens per watt.

MR. FERNSTROM: Thank you.

MR. FLAMM: Thank you. Dawn and then Tom Tolen.

MS. DeGRAZIO: Dawn DeGrazio with Sacramento Municipal Utility District. Two things, one is a clarification on the, again, on the efficacy. In an early slide, Nancy, I thought that it said for lamps less than 50 watts. And in the document it says less than 100 watts. So just something to watch out for. It needs to be one way or the other.

Then on page 22 under the heading controls, you had a controls table there. And that was all you showed. And my concern comes from the wording that goes with the table. When the standard is written it's just going to say, look at the table for your controls requirements, because the way that the wording is I thought was not stating what the intent was.

In other words it says the controls must be able to reduce -- I'm starting in the middle of the paragraph -- the controls must be able to reduce lighting power to at least 10 percent of

full output. And then something similar is stated for 50 percent.

I would suggest that instead it should say reduce lighting power to 10 percent of full output or less. Okay. Do you understand the difference? If you reduce it to at least 10 percent, 11 percent is at least 10 percent. So then you've complied, but --

MS. CLANTON: Very good, thank you, Dawn.

MR. FLAMM: Thank you. Mr. Tolen and then I'd like to move to the next topic.

MR. TOLEN: Tom Tolen with TMT Associates, an independent lighting designer. I have a question about your model, which kind of reflects a comment made by Cheryl -- unless I'm mistaken you used type 5 distribution for your model.

My experience is that typically most quality parking lot designs will use a type 2 or type 3 in the perimeter, which really changes where your minimums occur.

So, did you address that at all in your modeling, or do you intend to address that?

MS. CLANTON: Basically what we used

were actually if you use a type 3 or type 2, you will have a better quality lighting, itself. We looked at, I think, the typical space and the type of distribution.

You're talking about a well designed parking lot.

MR. TOLEN: Right.

MS. CLANTON: And we are looking at all parking lots. So we try to think what is the most typical type of equipment which is spilling out past the boundaries by using a type 5 at the perimeter.

So this we're hoping we're giving plenty of LPD, and would only approve it for a well designed parking lot. I mean you'll get higher light levels.

MR. TOLEN: Does the PIER data show what the typical distribution type is?

MS. CLANTON: No, because we're going to standard parking lots that we do not have the site plans for. We have no idea what the equipment is. It's on our best judgment. And looking at the luminaires in the daytime, a lighting expert pretty well can tell what type of equipment it is. In fact, we even found a lot of instances where

the reflectors were installed backwards. And so the type 3, trying to light the parking lot, was actually lighting --

MR. TOLEN: The neighbors.

MS. CLANTON: Or the canal next to it. And so we found a lot of poor installations with that. But, no, we could not go into that depth on the distribution types --

MR. TOLEN: Okay.

MS. CLANTON: -- that was observed. And we took pictures of all the luminaires, and so we do have that database.

MR. TOLEN: Okay. One more quick comment? This is a generic comment about the potential for using a high/low requirement.

I'm going to echo what Leslie's concerns were about that, about uniformity. Really the only way to do it uniformly is with a high/low type system.

I know you're trying to mimic the interior requirements for bilevel switching. I'm not sure it's practical from a cost effective point to do that. If you have to install high/low or dimming instead of simple on/off switching, you're going to add a lot of cost to any project.

So I'd like to express that concern.

MR. FLAMM: Thank you. Okay, I would like to move on now to building ground lighting, and that's on page 23 of the report. And, again, we're going to be graced with Ms. Clanton's presentation.

MS. CLANTON: Building grounds lighting. This is just kind of a preamble. This is one of the most difficult areas for us to wrestle with. And we came up with a proposed solution to how to assign an LPD to building grounds.

And we looked at what would be the easiest for the code officials to look at. And it's basically looking at all of the hardscaped areas, and using that area in order to calculate our LPD.

And so the hardscaped areas would include pedestrian walkways, stairs, ramps, patios, plazas, wherever the hardscaped areas are. Or the pathways that would be used.

What we did is we actually calculated then the LPD for those areas, and then increased the LPDs by 20 percent to allow for extraneous landscape lighting, feature lighting, other areas that you would have. And came up with this

particular method. So I just wanted to make that clear.

So we look at the LPD, again, maximums vary by the four different lighting zones. It's similar to parking lots, controls are needed during day and curfew hours. We did not include sports lighting or lighting that was in five feet of the perimeter, of the building perimeter.

And the reason for that is that we felt there was a cross-over between the building facades, which Larry will go through and explain that, and the grounds lighting. And we felt that if our sidewalk were located within five feet of the perimeter, which means it's right next to the building, the chances are that the lighting would be located on the facade, itself, lighting straight down versus putting up poles. And we felt that this was the most reasonable approach.

We looked at the specific design criteria. We used RP8 which is roadway lighting, and they again are the IES committee in charge for establishing lighting criteria for walkways.

By the way, RPA is one of the few documents that is ANSI approved.

And we have different illuminance

criteria, selected for different pedestrian conflict zones and use types.

We did use average horizontal illuminance which is stated in RP8; minimum vertical illuminance at 4.9 feet. It's a little different than the parking lot. Again, the committee, the way that they make their recommendations can vary.

And that the uniformity ratio average to minimum, which again is different than the parking lot, which is maximum to minimum horizontal illuminance.

We've got the different design criteria selected by the four lighting zones. For LZ1 we selected the low pedestrian conflict in rural and semi-rural housing. And I know that sounds strange, but that's as close as we could come to a lighting zone 1. And, again, because RP8, or none of the documents really go into the different environmental zones, or lighting zones, we had to apply our best knowledge or best guess into which lighting zone the different recommendations would fall into.

In lighting zone 2 we used low pedestrian conflict and low density housing.

Lighting zone 3 low pedestrian conflict and medium density housing. And then lighting zone 4, high pedestrian conflict and medium density housing.

Next slide. And with that we took the criteria that was stated in RP8 and applied it to the different lighting zones. For average horizontal illuminance, minimum vertical illuminance at 4.9 feet above the pavement, and then horizontal illuminance averaged to minimum ratio.

Next slide. The equipment we used, very similar to what we used on the parking lot lighting, metal halide lamps, horizontal burn. Again, the lumens, CWA ballasts. And the luminaires this time instead of being type 5 we used type 3 distribution, full cutoff with a light loss factor of .7.

Next slide. The typical dimensions of sidewalks were five feet wide. We used 15-foot high poles, and we spaced them between 60 and 90 feet on center or apart. And with these calculations we calculated the LPD based on only the sidewalk square footage for each particular cross-section.

Next slide. And here are the specifics

and what was used for the different lighting zones.

Next slide. The software, again, is AGI software. The initial design was based on a common pole height, lamp wattage and pole spacing.

Initially we needed to meet the average illuminance and the minimum vertical illuminance. And if this was not met, then we adjusted the lamp wattage and the spacing of the poles.

Then we checked the uniformity, and once again we adjust the spacing of the poles until uniformity was met. But it was extremely difficult to meet the uniformity criteria, especially in the LZ1.

And one thing that we did notice going through these models, I did talk with some people in the roadway lighting committee and expressed the concern of how tough it was to meet the criteria. And they said I'm not the only one to have had that problem.

So, it's just something I would like some input if anybody else has, with very low light levels, been able to meet the uniformity criteria. So we had difficulty in LZ1.

Next slide. So here are the lighting

calculations and the allowed power limit. And this shows what the criteria was, what was calculated and then came up with the power limit for each one.

Next slide. So the recommendations for controls, you basically have yes, photosensors, time clocks or astronomical time clocks to turn off the lighting during the daylight hours. And we also recommended some motion sensors or some way of turning the lighting power, or reducing the lighting power density during the curfew hours.

A lot of the comments that were made about controls for parking lot lighting, I think our frustration when we did the PIER project was that lights are left on all the time, even though after hours nobody is reducing their lighting, even though many local ordinances talk about reducing lighting down to security level.

And it may be something that equipment and manufacturers have to start relooking at outdoor lighting to come up with systems that we can either dim, go to a bilevel switching, or to be able to use the controls like motion sensors, to be able to have lighting turned off unless someone approaches the area. So I think we need

some push in technology.

And that is it. Any comments?

MR. FLAMM: Thank you. Questions or comments? Mr. Trimberger.

MR. TRIMBERGER: This, similar to parking lots, we have requirements for footcandles, and I guess our technology is not well defined, and perhaps not to the current standard. But I'd like to get some kind of comparison to see, you know.

This is what I've been talking about since the very beginning that if we've got a local ordinance that says you need to be this high and you got an energy standard that says you can only use this much energy, there's a genuine conflict that's going into effect.

Also lighting is a tool used in rehabilitation projects a lot. For neighborhoods that have blight and other issues. When they're redone they light them up. Are we still going to be able to do that? Maybe you'll have to get with some lighting designers to see how that would work.

I'm also concerned about the idea of curfew and you're cutting down lighting at curfew.

Curfew, I understand, is defined -- the curfew hours are defined by zones that were discussed earlier.

MS. HESCHONG: Curfew hours would be defined by the local jurisdiction. They have that opportunity, but it's not a requirement.

MR. TRIMBERGER: So curfew is not a mandatory part of the standards?

MS. HESCHONG: The standards require the control equipment to enable the equipment to be controlled during curfew, if a curfew exists, or may be implemented in the future. But the actual timing and operations of curfew are up to the local jurisdiction.

So the standards only require the controls. Which is the same basic approach that the interior lighting takes also.

MR. TRIMBERGER: Yeah, it is similar, but, you know, whether it's after curfew or not you still need to be able to have enough light to see where you're going; you have to have enough light for security. So, I think they're different issues.

I'll have to look and try to get into some numbers and see what this looks like.

MR. FLAMM: Are you done, Mr. Trimberger?

MR. TRIMBERGER: Yes.

MR. FLAMM: Okay. The gentleman in the back, please.

MR. McDERMOTT: Thanks. My name's Patrick McDermott; I'm with Sunbelt Industries. I just have a couple questions.

Nancy, you referred to RP8 as being an ANSI approved document. Why did we not use RP2, then, if we're looking at using ANSI approved documents as opposed to RP33?

MS. CLANTON: Because I don't think -- you have RP2; I don't think RP2 is an ANSI approved.

MR. McDERMOTT: To my knowledge it is.

MS. CLANTON: Is it? Does it say it on the front? It's not an ANSI approved. There's a, look inside of it -- I don't --

MR. McDERMOTT: Correct.

MS. CLANTON: I don't see it.

MR. McDERMOTT: All right, thank you.

MR. FLAMM: Thank you. And anyone else that comes up for the first time, if you would please give the transcriber your business card it

would help him so that he doesn't have to run back to you to get it from you.

Any additional comments or questions on this element? Ms. DeGrazio.

MS. DeGRAZIO: Dawn DeGrazio, Sacramento Municipal Utility District. At the beginning of this measure three it states that it covers walkways, plazas, stairs and ramps. Doesn't talk about landscape lighting until you get all the way back to the controls table. And then all of a sudden landscape lighting jumps in there.

Now, you clarified that a little bit, Nancy, in your presentation that the intent is that the numbers cover that. But I think it needs to be stated that landscape lighting is a part of building grounds lighting, but it's intended that way.

So that because my thought, as I read all the way through here, was is landscape lighting part of this, what about flags. And then that leads to the next thing, is a flag a monument. Because way early on in the document you talk about it does not include monuments. Okay, so we need to be -- to me that's kind of a mushy word. We need to talk about what's a

monument, okay.

And then the third thing is it says in the beginning of measure three that sports lighting is not included. And yet here it is in the controls table, recreation, sports lighting. So I think we have a little bit of clarification needs to happen.

MS. CLANTON: Thank you, Dawn, good points.

MR. FLAMM: Thank you. Okay, I'd like to move to the next and the last presentation by Nancy Clanton, which is going to be public right of way. And that's going to start on page 49 of the handouts.

MS. CLANTON: You can tell who's got the early plane to catch.

Okay, public right of way. This is a model standard and it will not be part of the title 24. And basically what we are proposing is LPD maximums that will vary by the four lighting zones, and by the roadway classification. And the roadway classifications are listed on the slide, expressway, major collector, local freeway classifications.

Next slide. The design criteria used is

again the ANSI approved standard RP8 on roadway lighting. And the lighting design criteria that we selected for the lighting zones for each roadway classification, out of all of the measures this was actually the easiest one to apply to the lighting zones.

So, basically with lighting zone 1 and 2 we used low pedestrian conflict. With lighting zone 3 we used medium pedestrian conflict. And then lighting zone 4 high pedestrian conflict.

Next slide. Now we've got the lighting design criteria, and I know for a fact this is impossible to read, but it's basically directly out of RP8 and for the different conflict zones, for the different roadway classifications. And it is listed in your document -- telling me what page it is -- 51.

Next slide. Lighting equipment used in the models. Once again, very similar to all the other lighting equipment with lamps and ballasts. And the luminaires type 3 full cutoff; light loss factor of .7; and the luminaires are located at the edge of the traveled way.

With these roadway models it is very difficult to come up with exactly what the

different roadway classifications were and what the roadway section would look like; how many lanes; how many turn lanes; shoulders; all of that.

So we went back to our best assumptions in all of the roadway projects our firm has done, and come up with different lane widths and the number of lanes that we felt best represented these roadway classification types.

Next slide. So, again, I'd like to just mention that the typical streets -- cross-sections. And the lighting calculations are performed across the entire traveled way for each particular class section.

The poles are located depending on the roadway type and cross-section. They're either on the single side of the street or the roadway, if it's a very narrow type of roadway cross-section. In a standard arrangement for the medium width roadways. And paired, or kind of opposite each side for the wider roadways.

Next slide. And here are the different roadway types. Boy, I cannot read that. My eyes are going back, Mazi.

The roadway classifications for the

different lamp types, the pole heights, so what we have done here is given you exactly the assumptions and the spacing that we used in all the models. So in case any of you are really curious in repeating all these models.

The calculation types -- okay, go to the next slide. Here are the calculations. Again, the same lighting analyst models. I want to make clear that all we tested out was the illuminance criteria even though RP8 also states luminance and small target visibility.

We felt that the most conservative way to go was only to look at illuminance criteria. And as we refine it, we are going to go through and do the other models and luminance and small target visibility.

The initial design was based on a common pole height, lamp wattages, pole spacing. And again, our initial criteria was to meet the average illuminance. And if we didn't do that, we adjusted the lamp wattage and the pole spacing. Then we went back, checked uniformity, and again adjusted spacing if the uniformity was not met.

Next slide. And here are the calculation results. And it will go through, and

what the criteria states and what our calculations were on all the different criteria. And also looking at the valing luminance, which is the glare index in all of that.

Next slide. So, our recommendations is that we actually, this is a measure, is proposed as a model standard to be voluntarily adopted by Caltrans and local California jurisdictions. It does include requirements for lighting controls, maximum lighting power and shielding of luminaires. And the requirements are expressed by the lighting zones.

Next slide. We have listed the lighting, the LPDs for the different lighting zones. And again the different roadway classifications.

Next slide. For controls, basically the only control we asked for in this recommendation is that during the day the lights are off. And then, again, all luminaires greater than 100 watts be IESNA cutoff type or full cutoff.

MR. FLAMM: Okay. Lights up, please. And then questions or comments on this element.

MR. FERNSTROM: Nancy, your calculations are based on metal halide lamps, I presume?

MS. CLANTON: Yes, they are.

MR. FERNSTROM: It's pretty common practice around here, whether we believe in it or not, to use high pressure sodium for roadway lighting.

So, would it not be appropriate to consider the additional efficacy of HPS lamps in coming up with the LPD criteria?

MS. CLANTON: Our reasoning for going with metal halide, I think we all recognize that the trend is going away from HPS to metal halide for better visibility. The roadway committee started a lamp spectral distribution committee which is delving into this issue and is coming out with a statement that will be approved by the IES board of directors in August.

And I'm a member of that committee, so I think we are seeing the writing on the wall that, you know, by the time that this recommendation is going to be adopted, that the trend will be to white light sources.

So we wanted to make sure we presented that in an accurate position instead of the high pressure sodium, in case lumens are beginning to be adjusted. And we did discuss, among the team,

whether we should apply that adjustment now. And because it wasn't an official stance with IES, we decided not to do it.

So, again, I think we're pretty conservative in our numbers.

MR. FERNSTROM: Well, I agree, and I'm arguing the case for energy efficiency, so I guess I would recommend that perhaps a different LPD be established for HPS lamps so as to guard against the possibility that someone would just use HPS lamps and have more lighting than is perhaps necessary within the given lighting power allowance.

MS. CLANTON: Good point.

MR. FLAMM: Any other questions? Dawn.

MS. DeGRAZIO: Dawn DeGrazio of Sacramento Municipal Utility District. Just a note on table 41 on page 55. Under expressway, LZ3 and LZ4, the values seem to be reversed, or something. The LZ4 number is actually less than the LZ3 number. And it doesn't happen anyplace else, so I thought maybe that was --

MR. ELEY: I've noticed that, as well. I think maybe the reason for that is that Nancy assumed a 1000 watt lamp for the LZ4 model, which

has an efficacy of 80 as opposed to the lamp that was assumed for LZ3, which had an efficacy of 55 or something like that.

But, Nancy, I'll just let you answer the question.

MS. CLANTON: Yeah, no, and again it's the poles stay the same, it's the width of the roadways varies so much, and again I would really appreciate, you know, somebody looking at the models and the cross-sections that we were doing.

But that's something that we are going to go back and check and make sure that the actual physical conditions of the roadway did not. Because the wider the roadway, one pole actually does more square footage versus a narrower roadway. So sometimes the lighting power densities, because of the conditions --

MS. DeGRAZIO: Okay.

MS. CLANTON: -- we'll look, and again it's struggling between what do these expressways and everything looks like. And, again, like Charles said, with the higher wattage lamp and further distribution --

MS. DeGRAZIO: Efficacy improves with the higher wattage. I guess my hesitation on a

1000 watt metal halide would be the drop in lamp life. And so would a municipality or state, DOT or whatever the state DOT, would they want to use that lamp.

MS. CLANTON: Right, or two 400 watts, you know, which --

MS. DeGRAZIO: Exactly.

MS. CLANTON: -- but then it's double the equipment. I mean good practice would be if you never use 1000, you would use two 400s.

MS. DeGRAZIO: -- and the conservative approach might be to back off a little because standard practice is not to go quite that far.

MS. CLANTON: Right, really good point. But we will re-look at those.

MR. FLAMM: Thank you. Yes, sir.

DR. CLAUS: Robert Claus. I want to put these two books in the record. One's an appraisal manual and the other is a general principles basic research. And some of what I'm going to say is cited in here, so I want to hand them over.

First of all, let me make a point very clear here that clearly under constitutional principles, land use planning is controlled by the state -- if it becomes too intrusive, then you

bring on constitutional constraints.

Clearly Gitlow v. New York followed by Near v. Minnesota, you have problems. But that's just part of the problem you're going to have with this document.

Number one, because it appears to me that there's complete failure to recognize that you're going interdisciplinary and regulating speech, you're not looking carefully at some of the problems you're introducing.

There is a manual called the manual of uniform traffic control devices. Now, far be it from me to suggest that federal highway safety and its engineers are the most competent people in the United States, but both the Canadians and the Mexicans in NAFTA agreed that that manual is the best document that's been produced.

And I would suggest there's nothing in Europe the equal of it. And that's not merely because I like one of the principal authors, Travis Brooks, and know the -- search director, Robert Schwab, it's because it stood up in court as a standard of care.

Now you keep referring to your standards here as guidelines, and that's what they are.

They're not standards of care. All of the illumination engineering material you're using are guidelines; they are not standards of care; they do not stand up. The MUTCD is a standard of care.

You violate that and you're going to immediately get penalized 10 percent of your highway funds. Now, I think that's a wakeup call. If you have difficulty look up Volpe v. South Dakota, that's a Supreme Court case where they decided they didn't want to follow a federal compliance agreement.

Now the MUTCD is -- here you have an adopted six-part volume that your transportation department has developed. You're not recognizing any of that. Okay, so you have a terrible compliance problem legally.

Then you got another problem. You're starting to invent terms again. I mean I think this zoning classification is interesting, but ask the pointed question, what's the source of this. It just came out of some big minds rational relationships. Speech that doesn't work.

You've got the same thing going on again. Why aren't you going to transportation engineers and looking at their category of

streets? I mean far be it the fact that you can get a PhD in it, but it might help to look at that categorization, because you're going to immediately find you have two classifications. You have federally controlled and state controlled.

You step on the federal control and you're going to learn what we learned in San Diego. It's do it our way or lose our money.

So you need to pay some attention to that. That's a second extremely complex problem you're bringing into this. That you do have overlying federal control in this because there is a standard of care.

Now you start putting up these signs and getting in the middle of their real reflectivity and violating their standard of care, you better have a lot deeper checkbook than I think this agency has. And that's what you're doing. Because you're stepping from guidelines into standards of care.

And apparently someone's not thinking about that. And what makes for an interesting lawsuit is to have somebody come into court and say I've got this guideline, and find out they

violated a standard of care.

And I would suggest the way you're wandering around on these rights-of-way you may get in the middle of a federal bus and get run right over.

And the reason I'm suggesting all of this is, and we will say this later, is you've got to open this process up to people because when you're in a multi-varied problem, when you're stepping legally from one burden of proof where you can assert and someone has to defeat you in court to when if you don't have the proof you pay. Because you're violating title 42 USC 1983. You're going to pay for that because you don't have the proof.

And it's not good enough to say I didn't know the transportation engineers categorize streets. And I didn't know there was an MUTCD. And I didn't know there was a standard of care.

I just think that you really need to take a step back and realize that you're stepping into water where you have appraisers. God forbid Reg Bessimer of the Federal Highway Administration is an appraiser, but he is. And he's going to tell you some things that you may not like to

hear. God forbid federal highway safety's got registered transportation engineers and they're going to tell you there's a standard of care. And Caltrans adheres to it.

But before you start trying to reinvent the world, because we're all urban planners, I would look at some of these cases, because the litigation gets very very difficult.

Thank you.

MR. FLAMM: Thank you. Any additional comments or questions?

MS. DAVIS: Leslie Davis with Auerbach and Glasow. I just wanted to make the comment that I can't speak to a lot of the things that the last gentleman spoke to, but I can say that, yes, RP8 is a recommended practice, and an ANSI document. But it also has been adopted for the City of San Francisco as their standard. So they have made it part of their City regulations. And we're doing a lot of work with the City of San Francisco, and that is the guideline that they have adopted as their City law.

MR. FLAMM: Okay, thank you.

MS. CLANTON: Also, the gentleman mentioned that the classifications were not

Federal Highway Administration, Department of Transportation classifications, and they are. This is an ANSI standard. It is identical, ASHTO is the identical standard as RP8. And it is an ANSI standard.

It is not a recommended practice. It goes beyond that. It is the one document we do have that is an ANSI standard.

DR. CLAUS: So you're suggesting, under the 1965 and '58 Highway Act that I'm telling you primaries and interstates are not treated differently? You're saying the ANSI standard controls? Is that what you're telling me?

Because that's exactly what you're saying. Primaries and interstates are under the 1958 and 1965 Highway Act, which carry with them the MUTCD.

Now, are you suggesting that ANSI has stepped in and usurped the power of the Federal Highway Administration? Because I don't understand that. I don't think they did, but it may have happened in the last 24 hours.

MS. HESCHONG: Sir, we're discussing a proposed model code which is optional for districts, cities to adopt. We're not discussing

here a proposed state regulation.

DR. CLAUS: What you're proposing is the use of a police power to manipulate a land use zone through lighting standards. That's controlled by the enabling statute, and in certain cases you have compliance agreements.

And if you don't understand that overrides that, you'd better take the time to learn it. Because you're confusing regulatory standards, standard of care, police powers and guidelines.

That's fine, but some of us spent a long time in school understanding the difference between those administrative terms. And they need to be distinguished here. And I'm astounded here that you don't know primaries and interstates are regulated differently with the MUTCD than city streets.

MR. FLAMM: Okay, thank you. The gentleman in the back, you have something to add?

MR. McDERMOTT: Thanks. I'd like to introduce a letter into the record from the IES to the California Energy Commission from Doug Paulin, which does state that RP2 is ANSI approved.

Which goes back to my question, it seems

like you're saying ANSI approved documents are the better documents to use. Then why did we base so much of this information on RP33, rather than RP2?

MS. CLANTON: RP33 was not even mentioned.

MR. McDERMOTT: In the earlier part, not this last portion; I'm talking about overall, service stations and things like that.

MS. CLANTON: We basically, what was --

MR. McDERMOTT: The lighting standards that you guys proposed for under canopy stations did refer to RP33.

MS. CLANTON: If you look at RP2 and look at where the information is for the service stations and the car dealerships, it's in Annex H of RP2. And there it basically states a couple things. One is that for a more detailed description of exterior lighting, it refers back to RP33. And it says that this is only a design guide for designers. And it also states that you should not be more than 20 to 1 than your surround. You should not be higher than that. And that is actually in RP2, also.

MR. McDERMOTT: Okay, thank you.

MR. FLAMM: Before you leave, excuse me,

would you come back, please. Are there any particular elements in RP2 that you understand are not being followed with our recommendations?

MR. McDERMOTT: Well, I know that in RP2, for example, the under canopy standards are 50, 30 and 20. And that's about 80 percent less than this -- that's 80 percent more than what you're proposing here, .5, .10 and 20 and 40. So that's a big difference.

And it all depends on the document that you look at. So, since RP2 is ANSI approved, maybe you should look at that as the guide instead of RP33. And you're saying that it's 50 percent, when actually compared to RP2, it's not.

Thank you.

MR. FLAMM: Thank you.

MR. SHIRAKH: Actually I have RP2 here, and the differences aren't as great. For gas islands for zone 4 we have four footcandles; RP2 has 50. For zone 3 they have 30 footcandles; we have 20. And for low, which would be zone 2, they have 20; we have 10.

So, at least for zones 3 and 4 the differences aren't as great as --

MR. FLAMM: Thank you. What I would

like to do is move on to the billboard and signage lighting element. And then after that we'll take a break, depending how long this takes. And we're going to have Lisa Heschong make the presentation. And that's on page 45 of the handout.

MS. HESCHONG: Okay. I was looking forward to doing this at the end of the day, but I find out now that I'm on stage for illuminated signs and billboards.

Next slide. Our first task was to describe the types of exterior illuminated signs in order to see if we could put them into logical categories, both in terms of being able to understand their energy use, and also in relationship to how they go through the typical building permit process.

So, if there's a very different path through the building permit process there might be a different set of regulations for a particular type.

The proposed way to describe these signs is there are four categories we are using. Externally illuminated includes billboards, roadside monuments, any kind of carved painted sign which is illuminated from outside of itself.

The second group of categories are internally illuminated. These are the glowing signs. We divided this into three categories. The first is cabinet or panel signs. I'll show you images of all these to help you understand how they differ.

Both those names seem to be in common usage. They're basically illuminated boxes with a translucent cover.

Channel letters which are illuminated letters or images, each individual letter or image is individually illuminated.

And then unfiltered signs where you are looking directly at the source of illumination, such as a neon or LED. So there's no filtering process.

So we're going next -- the design criteria was to look at current good practice for these various applications using efficient, commonly available sources. And efficient optics.

The intended assumptions for brightness varied by lighting zones. The assumption there is that brightness needs are relative to the surrounds. And that if you are competing with a very high ambient illumination that you need a

much brighter sign in order to be seen competitively against a bright background.

There are similar control requirements proposed, as there are for other elements. Most specifically turning off the lights, or dimming them after business hours, after curfew. Avoiding illumination during the daytime. Or in the case of the types of signs that are illuminated during the daytime where they are trying to compete with sunlight for brightness, that they have the option of being turned down at night when they don't need to compete against daylight conditions.

So those are the design criteria. Next. Keep going. All right. We've got some examples here of billboards and externally illuminated signs. I don't have a laser pointer. On the upper left and upper -- oh, we do have a laser pointer, so --

(Off-the-record conversation.)

MS. HESCHONG: I figured I needed to do a little bit of a tutorial on signage to make sure that we were all talking about the same type of items.

Here we have a billboard that's illuminated by a single source, so this is a one-

lamp billboard. Here is a much larger billboard; it's illuminated by four sources, one, two, three, four.

The industry commonly makes recommendations for how many sources you should use relative to the size of your billboard in order to get uniform illumination across the billboard.

We also have monument signs which are typically illuminated from below. They are set often at car light levels, so the cars also help to illuminate these signs.

And in the extreme case, here's a little church sign that has a single, low-powered light source on it, but it achieves most of its illumination again as the car passes, so it becomes much brighter. This particular photograph is not very good. You can actually read the thing much better in reality.

So, this is the range of externally illuminated signs we'll be talking about.

Next. This is a spreadsheet from a manufacturer recommending heights versus widths, number of lamps, power of the lamps. There was a little bit of a discussion here earlier today

about whether the metrics were in terms of lamp lumens or total system lumens. Over here I've put total system lumens, and converted these to an equivalent watts per square foot based on the system lumens. So we looked at a number of these ranges across different recommendations.

Next. So the assumptions in looking at what these recommendations would be, we adopted the same 55 mean lumens per watt that were used for the other standards, outdoor lighting standards.

Certainly, as Mr. Fernstrom has commented, there are better performance options available that would be coming forth with pulse start ceramic halide and electronic ballasts. So there's substantial improvements that will be commonly available in the future when these regulations come into effect.

Not only do they have higher mean lumens per watt, they have longer life and better lumen maintenance. So we're seeing overall better performance.

The assumptions also were that the luminaire that the billboards, the external lighting could be lit from above. And the primary

criteria here is that by lighting from above you reduce the dirt accumulation on the lens of the fixture. And according to IES calculations, overall you're going to increase the light output about 50 percent over the life of the fixture.

Now, this is in the design assumptions; this is not a requirement. This is simply as part of the calculations.

Also, assuming good optics, cutoff fixtures that are avoiding wasted light spilling far beyond the sign and that the sign is designed for visibility.

I would say that these are probably closer to what would go into the guidelines for good practice rather than the requirements that we're looking at.

Next. This was distilled into a specific set of requirements. One, that the light source exceed 55 mean lumens per watt, equals or exceeds. Then the calculated lighting power density per sign, I should say that the sign area is fairly easy to calculate in this case. It's the area, the illuminated area of the sign. So wherever the message is that's being illuminated.

The proposals are one watt per square

foot for lighting zone 2; two watts for lighting zone 3; and four watts for lighting zone 4. And these come down to basically using 100 watt metal halide lamps for lighting zone 2, 250 for lighting zone 3 and 400 for lighting zone 4. It's just rough guidelines.

For lighting zone 1, the assumption is that in general externally illuminated signs are used for way finding at night. And that there will be the occasional street signs that identify a establishment that you need to find. And it can be illuminated at the lowest possible level because it's in complete darkness. It will attract your attention.

Control requirements, again to turn off the lights after curfew essentially; and also to turn the lights off during the daytime so there's a photocontrol or an astronomical clock assuring that the lights get turned off once we have daytime conditions.

All right. Another universe of signs which are cabinet signs, also called panel signs. They are typically a metal box fitted with fluorescent lights or neon lights, inside neon tubes inside of them, with a translucent cover.

These signs were pioneered in the 1950s. And interestingly, once they get built they tend to stay put while the message gets changed. If a new tenant moves in, the translucent cover will come off, a new translucent cover will go on. But the structure and the electronics inside of the structure stay put throughout the life.

They use very thick acrylic covers, largely for structural strength. Also to assure diffusion. And one of the greatest fears of the owners of a panel sign is that a light will go out. If you have a condition here with a white surface and one light goes out, it really does erode the visibility of the sign. If you have a condition here where you have a dark background with light letters, it's less catastrophic to have one light go out.

But, as part of this, sign manufacturers tend to build in a lot of redundancy on their illumination sources so that they have less of a maintenance problem if they have short-lived lamps a light goes out.

Next. So, as I mentioned, the cabinet sign industry arose in the 1950s. The innovators then started packing these metal boxes with

fluorescent lamps. There's been very little development in lighting technology, lighting engineering of these signs since. The biggest advance was that they progressed from neon sources to typically fluorescent sources.

Clients who are buying these signs are primarily concerned about uniformity of illuminance and low maintenance. UV resistance and physical strength of the signs are also an issue. Energy and visibility are rarely discussed that I could note.

The results of these criteria result in very thick plastics, 3/16ths to 1/4 inch plastics with better diffusion, with very low transmission. Because of the low transmission covers the lamps are packed as close as possible together to get as much brightness as possible. And then also adding redundant lamps so that burnout is not noticed.

Next. Then we've got some -- this is the inside of a neon illuminated panel light. It's fabricated out of tin or aluminum. And we've got a number of neon tubes running through.

Here's a panel sign with either vertical fluorescent lights or horizontal fluorescent lights going across. Typically these are four

foot. For a very large sign they might be eight foot.

Materials that are being used, the white acrylic, an eighth of an inch transmission is typically 15 to 32 percent visible light transmittance. As that increases in thickness the transmission will drop proportionately.

If you're looking at a color diffuser the transmission characteristics vary depending on the spectral qualities of the source. So if you're matching a red light with a red diffuser you're going to get higher performance than a white light with a red diffuser.

And then the internal reflectance of these systems, if they're built of tin or aluminum are typically 50 to 70 percent; whereas if this internal space is a white enamel, or designed for high reflectance, it would be more 70 to 85 percent. It could be pushed up into the 90 percentage with the highest performing products.

Next. Common construction of these things. Typically they're built for minimum thickness at 6 to 9 inch depth of cabinet. Again, that limits the amount of diffusion that can occur. The lamps typically seem to be spaced six

to nine inches apart, again for uniformity.

The uniformity is directly from the source of the lamp. I couldn't find examples of optics being used to increase the diffusion. And then packing the box with maximum light output, very commonly T12s, and high output lamps in order to overcome the low transmission covers.

It would be possible to improve these sources using better optical diffusion, prismatic lenses and reflectors throughout which would allow for much wider spacing of lamps. And also better images with less power. Using more reflective surfaces also increases the light output. Matching the source color to the filter color also improves the efficiency of the system. And then using better visual design increases the visibility of the sign without increasing the power required for the sign. All of those are options.

Next. So the design criteria that we applied is that in lighting zone 1, again the national and state parks, there would be minimal lighting signage for identification purposes only.

For lighting zone 2, lower ambient lighting, so lower illumination levels are needed

in order to be competitive.

In lighting zone 3, you would expect current urban practice. In lighting zone 4, allowing for special effects and highest and brightness conditions.

Next. So for the cabinet sign proposed requirements are to assume the use of minimum 70 mean lumens per watt sources which are basically T8s with electronic ballasts. These are the old generation T8s, not the newest generation of T8s, which far exceed the 70 mean lumens per watt.

Lighting power recommendations. The same 20 watts per face that we saw for the billboards in lighting zone 1. Lighting zone 2, 4 watts per square foot; so 6 watts per square foot for 3; and 8 watts per square foot for lighting zone 4. And these are the corresponding spacings of T8 lamps.

Another assumption, the interior, we use highly reflective materials at 80 percent reflectance or higher. A preferred use of a translucent image and dark background; and again the same set of control requirements that we saw previously.

Next. Then we've got channel letters,

and these are the signages where the letter is internally illuminated, each letter has its own illumination source.

These illuminated signs were developed with internal neon sources because neon can be bent at these very small radiuses. There's a huge variety that have developed; these things are now advertised as the most common signage type, the most popular signage type. Typically every retail establishment may have at least one if not a couple of these signages.

There are new advancements that are being made in this area looking at new sources. This is an example of using LEDs as the source of illumination. The trick here is to be able to get a distributed source of illumination. And then also matching the color of the source relative to the filter and the desired color appearance which is going to give you a higher perceived brightness.

Next. Issues that come up with channel letters is that the brightness of the sign is very much a function of the color of the sign. And perception of brightness changes with the color. So that white, yellow and red are perceived as the

brightest colors; and green and blue are perceived at much lower brightness. In order to achieve equivalent perception of brightness, they need much higher illumination power in order to achieve the same perception.

The brightness is also a function of the color of the source relative to the color of the filter. When you match the same color source to the filter you get the highest perception and the most efficient system.

Brightness is also a function of the thickness of the acrylic filter. The thickness is less of an issue here than it is with panel signs because we have much smaller areas and we have much firmer attachments. Less weather conditions; less environmental stresses on the filter than they are for the panel signs.

The efficiency of the sign is a function of the color of the source as mentioned above. Neon, which is currently the most popular source, has a huge range of efficiency, at least 20 to 50 lumens per watt. These numbers are not typically reported. They are not easy to track. They are a function of the combination of the gas, the phosphors and the colored filter that are used for

neon piping.

So it would be very difficult for a building official to immediately verify what the efficacy of a neon source is, because it's so variable. The efficiency is also a function of the interior reflectances of the sign and the transmittance of the cover. So all of those go into factoring how well it performs.

Next. The proposed requirements for channel signs then are a minimum of 25 mean lumens per watt, which is essentially neon or better. I should add that there is an exception for light sources less than 5 watts per source, which means that LEDs would be accepted from this mean lumen per watt condition.

Lighting power, it's felt that it's too difficult to determine by area. If we go back to the images I had, the Takasushi, there's no regular dimensions. So being able to address what the area of the sign is is very difficult.

We can achieve substantial improvements by requiring highly reflective interior materials, 80 percent plus. This is basically a white painted interior. So a little bit more attention to the inside of the sign. It's also going to

improve weathering and water-proofness, if we do that.

Using a translucent image and opaque surrounds, and then the same set of controls that were being proposed for the other signage.

Next. Then our fifth source of -- excuse me, our fourth type of sign are unfiltered signs. Signs where you are directly perceiving the source of illumination. The most common is neon, which has been in use since the '20s and '30s and is now perceived to be a source of art as much as advertising and illumination.

If you pack enough neon tubes together you can get the appearance of a channel sign. So, this is three or four neon tubes packed together.

And then we have the emerging technology of using LED signs. The brightness and the energy use of LEDs is highly variable, depends on the density of the packing, the color and the technology is rapidly evolving.

One more quick -- what we find is that the LED animated signs which are often designed to be used during the daytime, I noted that some of the names are SunBlaster. They're intended to be extremely bright so that they can be read in

competition with sunlight. So we've got extremely high brightness on those.

Next. So similar to channel signs, the brightness of a unfiltered sign again is a function of the sign color. But also very importantly, the directionality of the source.

Neon is a diffuse source perceived in all directions; whereas LEDs are directional. They're extremely bright within a small cone of perception. The brightness drops off dramatically away from that cone.

The efficiency of these signs, again, is a function of the color of the source. Both neon and LED efficacies vary dramatically according to the color of the source. And also the density of the source, and especially relative to the LEDs, how densely they're packed.

Next. Let's go back one step. I seem to have lost the requirements for unfiltered signs. I don't know where it went.

The requirements for unfiltered signs are similar in that they're a minimum efficacy of 25 mean lumens per watt; again, neon with an exception for sources that are 5 watts per source or less. And a similar set of control

requirements.

With one additional control requirement which is that if they are operated during the daytime, as many of these animated LED signs are operated, that they have the ability to be operated at 50 percent of illumination levels, so that they have appropriate brightness under dark conditions if they're designed for maximum brightness during daylight conditions.

So, summary of proposals here are for externally illuminated signs there's a lighting power density and control requirements. For cabinet signs, panel signs, lighting power density control requirements. And requirements for internal reflectances of the sign.

Channel signs, there's no lighting power density requirement, but there is a requirement for minimum source efficacy and internal reflectances. Unfiltered signs, requirement for minimum source efficacy, controls and 50 percent brightness reduction requirement.

Sources less than 5 watts per source are excepted. And lighting zone 1 is proposed of a maximum of 20 watts per face of the sign.

That's it.

MR. FLAMM: Thank you. Questions and comments, please. Sir.

MR. MOORE: Yes, my name's Kerry Moore; I'm with GELcore, which is a joint venture of GE Lighting and McCore. We are an LED company.

I'd like to address the illumination of signs, and not the billboard signs.

Being a manufacturer of LED light savings products, we have two products I'd like to direct my comments to. One is the GE Tetra product which is used in covered neon applications. And the other one is the GE L80 signal used in the traffic control industry.

Today Caltrans has accepted the LED traffic light and recognizes it as an 80 to 90 percent energy savings light alternative. In the year 2001 between 350,000 and 400,000 traffic signals were changed from incandescent to LEDs, saving approximately 35 million watts of power to the State of California.

LED lighting systems for cover monochromatic light sources can realize similar savings in many applications, but not all.

We, today, would like to work with this body and the California Sign Association and other

interested parties in clarifying and coming to a common goal and reach the set-forth desires of this Committee and the state.

Number two. The system, I'd like to address the system, lumens per watt, as has been mentioned here. I think it's important, as identified by PG&E, that we look at the overall system and not just strictly light source. Specifically associated around the lumens per watt area, because of the power factor correction that may be looked at.

Unfortunately, in some applications, you have a very low power factor where the utility's delivering a set amount of energy; however, when it's measured in the watt category, it only represents half the energy.

So that if we look at the overview section of this bill, or proposed bill, under the environmental impact, the last sentence states that they're trying to reduce emissions from power plants.

If we look at system watts instead of strictly LPW, we have a better chance of obtaining that goal.

Thank you.

MR. FLAMM: Thank you. The gentleman in the back there, please.

MR. GASTINEAU: I'm Mark Gastineau, California Sign Association and Sign Users of California.

I'd just like to speak, I'm a little astounded that this has went so far. And I notice we're on here, our website, but we've never been contacted. We've done several state bills, state laws, Business and Professions Codes, studies to universities on the arts and sciences of signage. Yet we were never contacted for any of this information.

And I'd like to talk a little bit about what was said here. First of all, to go through this document, when we talk about curfews, dimming signs 50 percent, you cannot dim neon 50 percent. The gas will not ignite. You'll have no lumens. All you'll see is the gas snaking through the tubes. There is no current technology to do that.

When we talk about T8 lighting, T8 lighting does not have a cold source lighting or the sizes available to go to the signage industry to illuminate architectural graphics. These are misnomers and if there was communication with the

International Sign Association, California Sign Association, or any of the documentation that's out there, they would know that is there. It's misleading people to think that that's technology that's available right now to be used.

Light sources and signs are developed and are not arbitrary. I can put 100 lamps in a sign, or one foot on center, which is a common practice, for a certain depth, and that's where the light source comes from. It's reflective depth, the depth of the sign compared to the number of lamps on center. The more depth you get, the farther you can move the lights apart. She did say that.

But if one light goes out -- I can put three in there, but if one light goes out, you're going to see the discrepancy between that light source. These are architectural graphics. They are meant to display a message.

So to say we pack the signs full of lamps so we don't have to maintain them, I have no idea where she got that information. That's not the way we manufacture.

The manufacturing signs in the State of California, 98 percent of our cities and counties,

is regulated by UL, Underwriters Laboratory. It either has to be reflective material as aluminum or stainless steel, or be white-coated. So that is already regulatory to us. We have to build signs that way.

Then she says the weather. Signs are water resistant, they're not water proof. They have drain holes in them, water comes in, they drain out. That's also regulated by UL.

So, some of the stuff we're showing here is really disturbing to us. To say you're going to take a 14 by 48 billboard that has four 400 watt halothanes on it, from the base of the sign, usually four foot below the base of the sign, and get even lighting across the architectural graphic and put two on it or even one, as was proposed, is ludicrous. There's no way you can illuminate it.

In fact, some of the pictures she showed where all you saw was the light source and you could not read any graphic around it, that's actually what they're submitting to you. That's what they're asking you to believe is a good option to save power in our economy.

We are here to work with you. We had told PG&E and people that's what we're here in the

state for, to protect the interests and work together to make it a better place for all of us to live.

I know I'm jumping around a little bit here. The same as in dimming lights, and you had a graphic, and when they tell us that they're not trying to control a message, yet in their own language they say opaque backgrounds. Well, that's already been held up in a court of law that if you take a registered trade like McDonald's or a Blockbuster, blue, yellow border with white letters, and you black out the borders, you cannot see that, you only have white copy. You're interfering with the message. It is registered trademark to have that illumination showing in the backgrounds.

So, these things are things that are -- the way they're written they lead you to believe that this is a great, you know, great job we've done, and we're really trying to solve some problems. But we're getting into a legal basis where there's going to be litigation.

And right now, we've talked to people, Legal Cities hasn't been here, Chamber of Commerce hasn't been here, Small Business Association

hasn't been here. You think we're a little aggressive towards this, wait till they step in the room and start talking about this.

When you take, for instance, your L1 zone and you're talking about this wattage per square foot, or maximum per face, you're talking about in your neighborhoods where you might have a Mom and Pop's breakfast place; they can't have a four-by-four sign saying "Bernie's Breakfast and Donuts." They can't display that because they can't get enough wattage to do that.

That's how far out of reach this is. And there is common ground for us to go to.

One of the other areas that just because I've had one of my attorneys was talking to me about this Tucson, Pima County. This was all set up as an observatory there. This is like going to Carmel and saying they're going to have the same lighting zoning and ordinance as Sacramento County's going to have. That's ludicrous that they can have -- San Jose already has that. They have lighting zones around their observatories to keep trespass lighting out. So does Newport.

But to list this as this is, you know, an area that's prime ordinance, it's an exception

to the ordinance. It's probably one of the 100 in the United States that has that restrictive an ordinance in lighting because of the observatory.

Again, I would like to recommend that there's some dialogue that goes on with the leaders in the industry that manufactures other product; the people that manufacture the product and the people that use the product.

This has been tried federally and in several states. It's always been defeated because you get a Commission going out in a direction without talking to the public, which really has to be regulated. And we'd really like some input in that.

When you use LEDs, these gentlemen, we use LEDs now to illuminate signs. But we're talking about red and amber, guys. The other colors aren't proven. There's heat disorders in those colors that don't have a light source, a fluorescent source that we can use. But they are being used.

We weren't regulated to come from high voltage message centers, which Caltrans uses now, on your freeways, the big bold message centers. There's no regulation to take us to LEDs. We did

that because -- efficient for our customer and displays their messages that way. We didn't have to be regulated to come up with that source.

And so LEDs that are ready -- the biggest effect of LED is heat, and running them too hot. In other words, giving them too much energy. So most manufacturers, we only run them 70 percent in the daytime. We're dimming them 50 percent at nighttime now.

There is Caltrans law and federal highway law that tells us that we can't have so much intrusive light on the freeways or highways that we advertise. We have had people that run their signs too hot. We've had to go out and they're controllable; we can turn them down to 10 percent if we wanted to. That's not a problem for us.

When you talk about dimming fluorescents, HID lighting, you're talking about special ballasts to do that with. You're talking that you're going to distort our graphics. And, you know, it's a big cost to us to do that. There's other ways of doing this that's effective and efficient without destroying the graphics that we're trying to display for our customers.

Any questions?

MR. FLAMM: Okay, thank you. I'll just tell you personally that I had an effort to reach out to your organization and there have been several people for over a year that I have sent messages to. I have a log of that.

Maybe I was trying to contact the wrong people, but it's not for lack of effort. We appreciate you coming forward and offering to work with us, because we look forward to that. And the same with the League of Cities and the governments. I have personally made presentations. So it's not from lack of effort.

If there's anybody not at the table, please help us invite them, because that's been our --

MR. GASTINEAU: Yeah, I believe the Small Business Association and Chambers would be all over this. You can't run businesses -- I mean the effects of freeway signs alone, I mean the SBA really got interested and we started talking about communities would not let you advertise to the mobile public along the freeway.

Really what you're doing is driving down that property value, because they can't advertise

to the mobile public, and so there goes our tax source. And even they got involved and said, you're right, this is going to happen. And that's where we're at with this measure.

We're kind of a little upset because we are pretty high profile and we weren't contacted; yet we were listed. They hit our website. But nobody was contacted. We have technical committees. We wrote brochures from the University of San Diego. There's national brochures. And none of that is listed. So we're a little put out about this.

But we're willing, we want to work with you. We know you're trying to do your job. I think we have a lot of input to give to you.

MR. FLAMM: Well, I appreciate you stepping forward. Thank you.

MR. GASTINEAU: Thank you.

MR. FLAMM: The gentleman in the back.

MR. LANDERS: My name's Joe Landers. I'm with Allanson, International. We manufacture neon transformers, high output fluorescent ballasts, ballasts for high output fluorescent lamps.

And I've been in the sign trade for over

30 years. We have made a little bit of forward motion. We do have, at Allanson we do have electronic ballasts. And there are other manufacturers. And they can cut the power consumption from 35 to 55 percent approximately. It all depends on your combination of lamps.

And these are using T12, 800 milliamp high output lamps, which you showed in the signs with the quarter-inch and 3/16ths plex face.

The sign trade has also gone to a soft face, which is like a vinyl material that's stretchable. All your Home Depots, the big pole signs are that.

But to get away from a T12 lamp would probably not be the best thing to do, due to the fact that you would have to add more lamps. And the T12 800 milliamp lamp, there's 14 sizes available. You'll never find that in T8. And these 14 sizes make up different increments of signs.

Another thing you talk about, we have electronic transformers. And the savings on them is, in the consumption, is an awful lot. So there's a lot here that we are able to provide that you may not know about. But I would love to

attend any type of meeting you have, and to get it right. Because I think signs are construed to some people as being, oh, look at all the energy, it's an eyesore anyway, I don't like it.

But it is proven to keep people in business. And that is very important. So, that's it.

MR. FLAMM: Thank you.

MR. LANDERS: I will leave my card.

MR. FLAMM: Okay.

MR. GEORGE: Thank you. My name is Jim George; I'm President of PermLight Products. We're an LED lighting products manufacturer.

I'm also Chairman of NEMA Solid State Lighting Section. NEMA saw the need to organize information around LEDs and solid state lighting some time ago, and it is our intent to work with organizations like yours, to work with -- we're actively and aggressively working right now on defining terms and matrix for how to measure LEDs. And how to measure their efficacy, their energy consumption and the like.

And some of the issues that you raise here I think are specific to mis-defining. And I would recommend and would very much like to see

you work with NEMA Solid State Lighting Section to adopt the same definitions that we are using now, or that we are developing now, to work with the DOE and the next generation lighting initiative, which is part of the energy bill in Congress so that we can standardize what we're talking about and come to some common term, at least a common set of terms.

There are a number of issues, as I said, and most of the issues here are really, to us in the LED side of signs, we're not a sign company, but on the LED side of signs, these are prime issues. We need to address all of these. And we're encouraged that you're doing that.

But we want to make sure we do it right. And we want to do it with you. And NEMA stands ready to do that with you.

I think one of the things, just as an example, is the sign face luminance measured as a measurement of the wall plug power rather than in just simply lumens per watt or an interim measurement. Those kinds of issues, we need to take the whole system into view.

And I think a study to determine what those matrixes or what those efficacies are, I

think it's very important that we do that together. The federal government, the NGLI is working toward the same issues, saving energy, using LEDs. And we would like to work with you on that.

Thank you.

MR. FLAMM: Thank you. Sir.

MR. SLOAN: My name's Jim Sloan, Sloan LED. We're a 45-year old California corporation that makes LED products for the sign industry and others. We're members of CSA, ISA and several other sign associations.

And there's just three comments I'd like to make. First off, one is that signs are really indication, they're not illumination, and there's a distinction there that we might be trying to put a round peg in a square hole. And I think it's something that we need to be sensitive of and look at differently.

The other is that, you know, LEDs do offer a very efficient energy source that would be in concert with the stated purpose of the 5X program to reduce the energy in a technologically feasible way. And I think there are a couple of things that we can point to for that.

One is the traffic signal, which Kerry brought up earlier. And also the exit signs are also another LED source that has been around for a number of years.

And then lastly I'd just like to say that, you know, we, as an industry, would like to work with this body to help in the education process and develop these standards, as well.

So, thank you.

MR. FLAMM: Thank you. Yes, sir.

MR. ABRAMS: Jim Abrams, the California Hotel and Lodging Association; also the California Restaurant Association.

About a year ago when the Governor came out with his executive order to deal with the energy crisis we were facing at that time, and particularly outdoor lighting at night, a couple of the concerns that we raised then and then were incorporated into the executive order, I think they really fall into the same category here.

One, as far as signage is concerned, I didn't notice a motel or hotel sign up there, but we'll certainly get you one, but --

(Laughter.)

MR. ABRAMS: -- for a lot of places, the

ability to advertise and announce that you are there is solely by means of the sign on the freeway. That is the essence of staying in business or not staying in business. Not just for lodging, but for a lot of roadside establishments like that.

And for that reason, and again the Governor's order contemplated this when they put it together with the Office of Emergency Services, that for businesses that are open 24 hours a day, and for businesses that use that kind of a sign as their primary if not their only means of advertising marketing to that segment of the business community they're trying to reach, there were some exceptions.

I would offer as an exception, particularly concerned about the control mechanisms, because lodging establishments in particular, and there are a lot of 24-hour restaurants, as well, are going 24 hours a day. To contemplate that they're going to have to turn that lighting off at some point is really antithetical to how you do business.

One suggestion I would offer at this point is to look at exempting R1 occupancies from

the control mechanisms. And also I would like to urge that you consider perhaps differentiating between the functions that the signage provides.

In some cases, whether it's a billboard externally illuminated or internally illuminated sign, in some cases, as you mentioned, it's for purposes of identification. Here's the hotel, here's the restaurant.

But in some cases it's also for way-finding purposes. And I'm going to suggest that in some cases it may be important to have a higher illumination capability, and I don't know quite technically how to phrase that for you, but where you're trying to tell people to go here for parking, here for registration, for different kinds of things, as opposed to just saying here's the establishment. There may be some need.

Also, and this filters over into some of the other categories you've looked at, but I haven't heard this mentioned. At nighttime some outdoor areas are places of work for employees. And we have an obligation, under the Labor Code, as well as civil law situation, to deal with providing a safe place to work which, I think doesn't necessarily bring into play the same set

of considerations as apply to merely letting somebody on the road know that there is a hotel or a restaurant.

In parking areas and outdoor landscaped areas and things like that; you have maintenance crews, cleanup crews, people doing a variety of different things. So I'd like to ask you perhaps to look at the extent to which the safety of somebody's workplace might need to be integrated into the considerations that you're looking at here.

And I think a lot of people have said this on and off during the hearing that I've attended so far today that people would like to work with you all, and I guess I'd like to suggest that perhaps a process to do that be discussed before you break today. I don't know what time you're looking at, 3:00 or 3:30, whatever that time was.

I notice in your documentation you're contemplating a hearing sometime in August at which the proposed building standards would be put forward, is that correct?

The date has not been set yet, but --

MR. ELEY: It's a little flexible.

MR. ABRAMS: Understood.

MS. WILLIS: But something like that.

MR. ABRAMS: Understood. I guess what I'm concerned about is that I, like the other gentlemen and other speakers have said, we'd like to work with you. But unless there's a bit of a structure in which we can be -- our feet can be held to the fire, if you will. I mean I think somebody ought to say to me, if you're going to gripe about security at hotels, you've got to come forward and sit down with the staff or the consultants and either put up or shut up. You've got to have some suggestions or make some recommendations, or what.

And so I think, I would hope that there would be a process to force, quite frankly, people like me, people who are having concerns and raising questions, to come forward and have an opportunity before that August hearing. Because then it's going to be pretty much a close-to-finished product, I'm inferring.

MR. PENNINGTON: Not at all.

MR. ABRAMS: Okay, but even so, between now and August I think it would be helpful if people like me, people from the signage, equipment

manufacturing side can be in an environment with you, with the consultants, to actually spend some quality time and say here are some suggestions, what about this, what about that.

And I really feel it's imperative that we just not come to the hearing in August and reiterate what we're doing here. And I think people like me ought to have both the opportunity, but also the obligation to come forward with some recommendations.

A question, just to ask it, and I don't know if it pertains strictly to the outdoor signage issue. The cost element, which is so much an integral part of what the Commission does, I've not seen that mentioned at all. Is that because it's not relevant to this particular proceeding? Or am I missing a piece of it? I'm just curious where the cost element of all these different measures fits in.

MR. ELEY: What we did, Jim, was we showed under each of the chapters, or at least some of the chapters, that the lighting technologies that are the basis of the requirement are, in fact, cost effective compared to the competing technologies.

So that's the -- if you look at the, I believe the unconditioned spaces, several of them have a comparison where we look at, so --

MR. ABRAMS: Okay, so that is a relevant concern --

MR. ELEY: Yeah, it --

MR. ABRAMS: -- and consideration so --

MR. ELEY: -- is, it's very definitely a relevant concern. The statutes requires that we show that these standards are cost effective.

MR. ABRAMS: Understood. And one last thing, and again it applies to all of the segments you've been discussing today, is the retroactivity portion of this.

For example, a lot of the signs that Lisa was discussing, it may be a Motel 6 today, but it might be a Super 8 tomorrow, or a DaysInn. If the sign cover is changed, what triggers the compliance, not just for this, but for parking lots and -- what triggers the compliance? And that's a question.

MR. ELEY: It's a good question.

MR. ABRAMS: Okay.

MR. SHIRAKH: -- interior lighting what triggers it is you have to pull a permit, --

MR. ABRAMS: Right.

MR. SHIRAKH: -- of tenant improvement; and the other condition is that if you're replacing 50 percent of the fixtures --

MR. ELEY: Or more.

MR. SHIRAKH: -- or more, that will trigger it. Now, again, the same criteria could apply to many of the outdoor lighting functions, although signs present a separate problem.

Generally if you're replacing the cover or if you're even replacing the lamps and the ballasts it does not trigger.

MR. ABRAMS: And I'm not suggesting it ought to be one way or the other. I just want to understand it so that people in business can figure out what this is going to be --

MR. ELEY: I'm not sure we've defined what that trigger is yet. But we need to.

MR. ABRAMS: Thank you.

MR. FLAMM: Thank you. The gentleman in the back, yes.

MR. ARAN: Jeff Aran with the Sign Users Council of California. I'm not going to restate everything that's been said, you know, to reiterate the points that have been made and the

concerns.

Just two points, though. I think when you start drafting these regulations they need to include a clear statement that existing signage is grandfathered in unless perhaps there's some, you know, triggering event that should cause it to have to be reconstructed. For example, it's destroyed or whatnot.

The other thing is that I again want to reiterate this, that the Commission and the consultants, when they start putting this together, have to be very careful to avoid making this operate or have the effect of zoning. Because this is a significant concern for all of us.

I think you've heard it not only from the signage folks, you've heard it from the building officials, you're hearing it from other people that this creates this layer of zoning bureaucracy that currently does not exist. It may be a standard, such as you think of a standard, but the way it's operating so far, the way it appears to us is that that's the result. And I can assure you that that's going to be an issue that we need to sit down and address together.

Lastly, Gary, we mentioned earlier outside that we'd like to pick a day in the near future for the consultants, CEC Staff, as well as some of us who are affected, to get together, you know, from the standpoint, and go over some of our concerns one-by-one, line-by-line.

I'd like to urge that to happen. Obviously as quickly as possible, which may mean that you ought to consider postponing your August meeting simply because I hate to see this rush happen, push, push, push for regulations that are just going to be attacked.

I think it would be better for everybody to sit down together and try to work out some of these details.

Thank you.

MR. FLAMM: Okay, thank you. Before we go to -- you're next, but before we got, we're past the time where we're supposed to be back from a break. So, what is the wish of this group? Do you want to stay here all night, or do you want to forego your break? Think about that and we'll have the next gentleman speak.

DR. CLAUS: Robert Claus. And I'm going to go through some things, and then I'm going to

draw some conclusions. Because I'm not quite as generous as the man from the Motel Association.

You're attempting to use police powers to manipulate civil rights. And I'm sorry I'm not generous that you should be excused from certain things.

Now, let me go over some basic things that have occurred here that are just, you shake your head. The term kept being used, acrylics, acrylics. The sign industry hasn't done anything. What about polycarbonates? What about butarants? Now, I mean anybody who's working in it knows that they've lead the field in that. They've been the experimental area in that.

And if you don't work in plastics and you don't even know they're using polycarbonates versus the acrylics, and you talk about thick signs, you want high impact you go to polycarbonates. Now, why do you say that, because you haven't looked at the industry.

Then you take, for instance, in your reference section you mention Business and Professions Code. Guess what? You cut it off before 5499. Now, is that serious? Well, I think it is because you've got an appellate court case,

Denny's Restaurant v. Agora Hills specifically on point on the Business and Professions Code this group of people mentioned, that says you substantially impair a business, and it's now been litigated more than at the appellate level, also Santa Monica, you buy it.

Now, if you don't cite that you start with you're got the wrong definition of plastics; then you turn around and you don't have the law cited right. Then you turn around and ask questions about we're going to retroactively force people to fix these things. I don't think so. You better know the law first.

Then secondarily you've created these terms over and over. They're inventions. The problem with rational relationships -- and everybody thinks they can get away with it in land use planning, and we finally got that stopped in a number of cities after we sued them, because they got the idea we're tired of it -- rational relationships are the products of these big minds. They're not the product of research.

When you make a statement like unfiltered signs and you do not realize that neon signs are specifically built to have a different

day/night appearance. You have reflective materials on them; at night the neon comes on to create a different ambience and also different memory pattern.

Why do you go outside and start inventing terms? We've invented zoning; we've invented traffic; and now we're inventing the terminology for signs. We don't talk about acrylics; we don't talk about the law.

Then you get to something, we flip a term up here, signs shall only identify. Take the time to look at Thomas V. Collins, it's a 1954 Supreme Court. And I'm proud to say a group I'm affiliated with, the AFL/CIO, finally had enough of these big rational brains that told us we couldn't come in and solicit. To solicit was wrong. That's prior restraint of trade. And you've got the word up here on the board. I'm going to hear that's not content. Well, it is content.

So, we're running every possible place. Now, what's really the bottomline that this group ought to think about? You've got land use planning that you've created. You created it outside the standard terms.

You've not looked at Ambler Realty v. Euclid. You've not looked at Nektow. You don't have any clear variance and say you're going to have to have it in order to avoid takings. You're outside state law.

The code's anti-aesthetic, it's pro-sprawl. Everything they claim they're doing in urban planning now this code's against. We're trying to get maximum productive, and actually under the enabling act that's required, of the site so you don't have to build other sites. And this code goes against that. So it's going against all of the urban land use planning trends.

And it finishes up by recommending civil rights violations. That's title 42 USC 1983. It's an amazing document. And you really feel confident when you read it when the language is so carefully put together that signs serving manufacturers, when you're talking about billboard people and manufacture signs, that's a medium.

And then you come in for a display and what do you find up on the wall. You find media, which is billboards, Viacom and the likes, mixed up with on-premise, mixed up with directional on-premise signs. That tends to lower your

confidence and it tends to make you wonder if there wasn't a preset to try to create regulations that are not necessary.

And I will tell you, are not going to conserve energy. You cannot, in a systemic environment, with a culture that spends $550 billion -- let me repeat that so you understand, $550 billion on marketing and advertising in a $10 trillion account, you cannot pick on the keystone of all of that advertising, from signature buildings to sign sentry to on-premise signs, and not create extreme dis-economies.

You're not going to save anything. You're going to burn all kinds of energy. So what you really need to do is what these people are suggesting. You need to say, we're not going to let you invent terms; we're not going to let you come up with something that you don't have the research to support; and either drop this regulation on signs, or go back with the industry to the drawingboard.

And let me tell you I am horrified when I see something like this on the board and I don't once see readability and confiscuity factors even discussed.

Now, if you're going to do that, and I don't know what you're paying for this study, you'd better go back and get the people whose civil rights you're manipulating, and you will pay for in court manipulating, involved. And you'd better lay your facts on the table.

I appreciate dark skies as an agenda, because we all know sooner or later when we have a Mars attack we're going to need to turn our lights off. But in the meantime we'd better stay with some reality and we'd better stay with the sources that prevailed in court.

What cost San Diego about a million dollars was fictional thinking like this that Rose Byrd thought she could support, that the Supreme Court wouldn't support. And have consistently not supported it since.

And more than that, that you had better think about, because you are going to hear this, this attack on signs is inherently discriminatory against particular categories of people. Because when you start getting into this facade lighting, and you start getting into this outdoor display, and you start taking on Synden Corporation, you're going to learn the same lesson that Tempe learned.

It isn't going to happen.

And then what's going to happen is you're going to come back and attack the ground-mounted and the building-mounted signs, which are the two definitions you should have, not filtered and unfiltered and whatever, I mean this fictional stuff is kind of deep for me to tolerate at my age, and you're going to find that you're discriminating and you're hurting your own communities. And you're not creating any efficiency.

We've been there before. When Paul Sabin did his survey in Oregon he found out that almost without exception these kind of lighting bans discriminate against small business. And that's when he began to wonder what's the point of turning off signs when you have surplus energy. You're creating revenue erosion and you're discriminating all at the same time.

And that happens because you're mixing a complex subject, an interdisciplinary subject, and you're mixing marketing and advertising, transportation engineering into some kind of effort to save energy.

And I just recommend that you go back

because obviously the purpose of this is to create a record, so we're starting to exhaust the administrative remedy. Why are we doing that? For the same reason it happened at Denny's in Agora Hills.

Enough's enough. We don't want to be the guinea pig; we don't want to be stuck out as an industry that's picked on, particularly when people won't even look at the most popular websites and the manuscripts and the books that would have told them this.

Let me put it simply. You can't dim neon. And that's what this report is. It's poorly thought through. It isn't researched, and it wasn't communicated.

Now, I'm sorry to be this harsh, but I'm just not generous in this anymore, because the research is out there for anyone who does not have filters on to look at it.

Thank you.

MR. FLAMM: Thank you.

MS. BRUHN: Lisa Bruhn with the National Dark Sky Association, the San Diego section. I'd like to make a general comment, but as a comment as part of the general public.

I am in support of this initiative by the CEC and the subcontractors for outdoor lighting standards. And I appreciate the efforts that are being put forth by the Commission and the subcontractors to reduce energy.

I enjoy living in an urban area, and I also enjoy looking up at the night skies, which sometimes is a conflict of interest there. I also enjoy driving down the roadways and not being glared by lights from businesses along the roadway.

I do applaud the Seattle section for having gone through this process and adopting standards. And I do applaud the gentleman from the hotel industry who -- and a few others who spoke who offer their support and effort of cooperation.

MR. FLAMM: Thank you. Additional comments? Okay, Gary.

MR. FERNSTROM: Thank you, Gary. PG&E made an idea proposal around self-illuminated signs. And we've held off further developing that proposal and submitting more detail pending some discussion with the California Sign Association.

However, I do have some comments on the

staff recommendations at this point. I'd like to say that I think externally and internally illuminated signs represent a good and important opportunity for energy savings in California.

Technology has come beyond where industry standard practice is in terms of energy efficiency. And from PG&E's perspective there is significant opportunity in the sign industry to provide the same luminance, the same utility, the same usefulness with far less energy use than is currently being utilized.

With respect to the staff recommendation, the consultants' recommendation, I think Lisa did an excellent job in structuring the proposal and in characterizing the opportunity. The architecture of the proposal looks very good to us.

However, I think with respect to externally illuminated signs, billboards, provided we can find metal halide lamps that are pulse start in a horizontal burn position, that the basis of the standard ought to be using pulse start technology rather than standard technology.

In the case of the panel box or cabinet signs, we believe that T8s and electronic ballasts

should form the basis of the standard. T12, while it does come in many sizes and has attributes that are certainly important to the sign industry, are far less efficacious as a source than T8s.

And electronic ballasts are not typically used with those lamps. So there's a significant improvement, about 30 percent energy efficiency improvement opportunity associated with T8s and electronic ballasts.

We're reluctant, however, to support a lighting power density or lamp efficacy standard for these box signs because it's quite possible that due to their unique characteristics, light-emitting diodes may serve to be a more efficient source or offer an energy efficiency opportunity in these signs.

So I think that LEDs should be exempted from that lumens per watt requirement, against the contingency that they may provide quite an efficacious source in box or cabinet signs in the future.

We agree with the staff on controls and curfew times for dimming. We think in the early morning hours there are many signs that could be dimmed to 50 percent, and still provide visibility

and have the message readable to the public. But with far less energy use.

We think whatever provisions are adopted in this proceeding should not limit the ability to address energy efficiency in signs in other proceeding such as Title 20. So we would hate to see a standard adopted here that precludes addressing some of these issues in title 20 if we find that to be a more appropriate venue.

And lastly, on the issue of channel letter signs, we think that there should be a lighting power density requirement; 24 lumens per watt for neon represents the status quo and essentially no improvement over the current technology.

We've seen, in the case of LEDs with traffic signals and exit signs, energy savings in the range of 75 to 85 to 90 percent. These similar savings can be accomplished in channel letter signs using either LED technology or the best neon technology available with electronic transformers. The gentleman from Allanson referred to that possibility.

Additionally, all of the California utilities have implemented a utility rebate

program for red channel letter sign conversion to LEDs. We've documented the energy savings associated with that measure and presented it to the Public Utilities Commission.

So it's clear there is an important opportunity here for California. We think that a lighting power density standard for channel letter signs is totally appropriate. And if we don't adopt such a standard we'll be leaving significant opportunity on the table.

We look forward to working with the California Sign Association and others that have spoken here today, in refining our proposal and submitting it to you in the near future.

Thank you.

MR. FLAMM: Thank you. I'd like to propose that we forget our break. We have a lot to do still and it's going on 4:00. So if anybody needs to take a break, please do so informally, but make sure you come back, because I'll have the guard watching you.

And, Dawn.

MS. DeGRAZIO: Dawn DeGrazio, Sacramento Municipal Utility District. Just wanted to reiterate a little bit about what Gary Fernstrom

said. I think this was very well structured from a standpoint of lighting and energy savings.

And in support of the notion of going to T8s instead of staying with the T12 technologies, there's been great strides in T8 HO lamps, the high output lamps that are meant to be a replacement and are a very good replacement for the T12 HO 800 milliamp scenario.

You have better color rendering. You have more choices of white. Those two things alone go a long ways in supporting what you can do with signage and how effective can your advertising be, and how good can your sign look, and how the colors can jump out at you.

Beyond that you have a longer life; you have better lumen maintenance so you don't have the huge degradation that comes over time with the T12 HOs. And you have the same zero to restarting temperature.

So there's a lot to be said for making a change to T8 HOs as opposed to just trying to stay with T12 HOs and justify.

MR. FLAMM: Thank you. Okay. I recommend we move to the next element, which will be unconditioned buildings. Larry.

MR. AYERS: Moving on, unconditioned buildings. The description of this is to expand the scope of title 24 standards to include unconditioned spaces. Unconditioned spaces right now are not currently regulated; they're specifically excluded from the title 24. But we're proposing both the prescriptive lighting power density requirements and also the mandatory lighting control requirements that are already written into title 24 for conditioned spaces.

Next. The design criteria. First of all, CEC has some existing models for many conditioned buildings, and these models work just fine for unconditioned spaces. Whether there was any air conditioning or heating or something like that, was not built into the model, so it really doesn't matter. They're effective.

The task you're illuminating, what you're going to be doing, are the same, whether there's air conditioning or not. And therefore the lighting for the task is the same.

However, there's one model that we developed for parking garages, because the CEC does not have a model for a conditioned parking garage.

I'll also point out that IESNA, in their 90.1 standard, the ASHRAE IES standard, does have some garage models. Now those models in that standard use some different calculation techniques, but the tasks and the ambient area ratios, and also the illumination levels in the task and ambient, we use in this new model are the same as ASHRAE IES 90.1 used.

Next. The space that we modeled was 150 feet long, 50 feet wide, 9 feet tall. The reflectances were selected for concrete. In the task area a 50 footcandle level was selected just as the IES models. For 10 percent of the space. And this is to allow for the eye accommodation whether you're going into a darker garage from the sunlight outside, or if you're going outside at night from a probably lighter garage into the darkness. The remaining 90 percent of the space was at a 5 footcandle level.

The lighting equipment we selected for this model is the T8 second generation fluorescent lamp with electronic ballast. And this combination has already been demonstrated to be effective or cost effective in conditioned spaces. So therefore it's going to be cost effective in an

unconditioned garage.

There's some alternate sources that you could use that are approximately as efficacious as the T8 second generation lamps, and they might be T5 lamps, some metal halide lamps, and some high pressure sodium alternate sources. There are pluses and minuses to each of these, and it's up to the lighting designer to decide which would work best, but any of these would probably work.

One key concern that we looked at is the temperature effect on fluorescent sources. Fluorescent sources, ever since they were introduced to our society, have been temperature sensitive based on the amount of mercury that's actually in the arc. And that's a function of the temperature.

A few lamp sources may use amalgam to source the mercury and they may be less temperature sensitive, but in general most lamps don't have the amalgam and they have some specific temperature sensitivity.

Certainly if you're going to be building a parking garage or any unconditioned building in a cold climate, that would be a consideration. Or perhaps in a hot climate.

But I'd like to point out that fluorescent sources have been used in unconditioned buildings for quite some time throughout the state. So they're very widely used, even though the existing sources, and the ones that have been used for decades, have the same sort of temperature problem. So probably it's not a big issue.

There's one other point, and that is that many of the current electronic ballasts that are offered will start fluorescent lamps at fairly low temperatures like zero degrees Fahrenheit. Some of the T12 lamps that are now used, the 34 watt ones, for example, with a magnetic ballast, may not start regularly below 60 degrees Fahrenheit.

So, that's very understandably an issue with an unconditioned building if your lamps won't start, and yet the current electronic ballasts often will start those lamps without a problem.

Next slide. Existing models the CEC already has. Now, these are for conditioned buildings, but once again, they'll work just fine for unconditioned buildings. Things like auto repair, commercial/industrial storage, electrical

and mechanical rooms, industrial areas, high bay, low bay, precision, laundries, kitchens and transportation facilities.

Next slide. The previous ones I just mentioned were for area categories in title 24. But there are also some complete building category models, and they're for general commercial/ industrial work buildings with high bay and low bay lighting. And also for industrial and commercial storage buildings.

And, once again, they're existing models and they work fine. So we're just going to continue with those models.

The new model that we developed basically computes, it uses the lumen method like a coefficiency of utilization, a typical method, to compute the power needed for target average illuminations throughout the parking space.

And then using this it calculates the resulting theoretical lighting power density. And based on this theoretical lighting power density we round it up to a more even value to get the recommended lighting power density, and that is some design flexibility.

And the recommendation is 0.30 watts per

square foot for the unconditioned parking garage.

And just as a comparison of the IES 90.1 complete building recommendation, it's 0.35 watts per square foot.

Next slide. Recommendations. Modify section 100 and the other sections in title 24 so they don't exclude unconditioned buildings from needing to meet the requirements, specifically requirements in sections 130 and 132 for the mandatory lighting controls, and also 146 for the prescriptive requirements.

We suggest adding a new area category, parking garages, at 0.3 watts per square foot for table 1 and in section 146. This is where there's a long list of the various categories and your lighting power allowances. Well, this is just one other thing to add to that.

Also add a fifth paragraph in section 150(k) which is a residential area. And say that if low rise residential buildings have a parking garage for eight or more motor vehicles, then it has to comply with the lighting control requirements in section 130.

Final slide. Finally, add a definition for parking garage into the definition section.

And I won't read the whole text to you. I'm sure you have it in your handout, but basically it defines a parking garage as having eight or more spaces.

Any questions?

MR. FLAMM: Questions or comments? Mr. Hogan.

MR. HOGAN: John Hogan, City of Seattle. I'd say it's a no-brainer to have the lighting requirements apply to unconditioned versus conditioned spaces. The key issue is the use in the space. We've regulated them without any distinction for 22 years.

For apartment garage lighting for enclosed spaces we have a 0.2 watts a square foot. An option for people who want some higher light levels -- higher sources, but obviously you've used certain reflectances for concrete. People can paint the insides of parking garages light colors, or do other things to improve the amount of footcandles in the space.

Thank you.

MR. FLAMM: Thank you. Mr. Trimberger.

MR. TRIMBERGER: Years ago I used to work the building permit counter. People would

come in with their building plans and they'd show the work they're doing. And this is going to be, you know, heated and air conditioned space. I'd say okay, well, you need to provide the energy calculations based on that. No. Okay, I'm not going to air condition, I'll just put this little unit heater up on the roof. Okay, you still got to do energy calculations. Okay, I'll take that out.

Now we're in a semi-conditioned energy and now unconditioned energy building. You are creating a disincentive to get permits.

We need to look rationally, and I don't have an answer yet. We need to look at some kind of exclusions from this.

We typically, we issue permits for -- state law requires permits for agricultural exempt buildings that meet certain criteria. I have to give them basically free permits and very cursory review for structural and other issues.

Whether they're under, you know, a small building, small square footage buildings, out-buildings in residential construction for barns or such. Those are some that typically they don't like to get the building department in there

anyway.

And also maybe to look in -- we're looking at the whole building method which is you just demonstrate if you're below that square footage you're in. Is that -- okay.

Or perhaps, you know, that you can have your building, you know, do it, but put in occupancy sensors or something like that, could be another way that they can get out of having to do calculations. I don't know what the technology is, if there's an inexpensive technology that can get them out of that. That could be another winner.

This is going to be a lot of work for building officials. We issue a lot of buildings that are not conditioned. And they have been easy in the past. They're not going to be quite so easy anymore.

So this is a big concern to building officials, and we'll work with you in the future on looking to see if there's some kind of shortcuts we can take.

MR. FLAMM: Thank you. Do you have a list of those exemptions?

MR. TRIMBERGER: No.

MR. FLAMM: Okay, thank you.

MR. TRIMBERGER: I can get you some suggestions, though.

MR. FLAMM: Thank you.

MR. HOGAN: John Hogan, City of Seattle. If I might outline our process that we use for these projects.

If you have a space that doesn't have any conditioning, then there's no requirement for any building permit review or review during mechanical, so essentially we're talking about the electrical permit application here. Because that's really the only thing that's keying in, is that you need to comply with the lighting requirements.

We issue approximately 10,000 permits over our electrical counter every year. And a lot of those are over the counter, they're not done with plans. And so we have a simple, one-page form that people fill out. Here's the square footage, here's the watts per square foot allowed, here's the use, the square footage, the watts per square foot allowed, total watts allowed. Here's what they're proposing, you know, could be a number of circuits or a different type of thing

indicating the wattage.

And so we haven't found that to be a big burden to do that. And, again, it's keyed just into the electrical permit, so it's not something that's tying up building permit applications or mechanical permit applications. It's just the electrical.

MR. FLAMM: Who has to sign that document? Engineer of record or --

MR. HOGAN: The form, itself, which has the calculations on it doesn't need to be signed. Whoever applies for the permit, the electrical permit, has to sign the application form for the electrical permit. So that can be a contractor, usually a contractor.

MR. FLAMM: Okay, thank you. Any other comments? Jack.

MR. SALES: Jack Sales, IDA. I guess I was thinking along the lines of opposite to that gentleman across there, and thinking about the idea of taking the cement surfaces and thinking about this as more of an interior.

And when we're looking at interior lighting we're concerned about the surfaces. And part of the reasoning there is that recently we

had the opportunity to be in a parking garage in Sacramento where they were about to paint the garage white. And they had all the lights covered with paper.

And we felt that the lighting levels with the covered luminaires with paper was just about right. So you can imagine what it's going to be when it's all painted white.

MR. ELEY: And they pull the paper off.

MR. SALES: And they pull the paper off, yeah. Thank you.

MR. FLAMM: Thank you. Okay. Why don't we go ahead and move on with building facades, and wait for Lisa to come back.

Building facades is page 30 of the handout.

MR. AYERS: Building facades, a description of the proposed measure. Prescriptive lighting power density and mandated additional lighting controls.

The lighting power density maximums would vary from nothing to all the way up to half a watt per square foot based on which zone you're in.

Lighting power allowances only for

facade lighting. In other words, you can't trade it with any other allowance whether it's for another outdoor lighting or another interior lighting, or even if you have a facade on the other side of the building.

There's no power allowance if a facade isn't lit. So it's use it or lose it if you don't light the facade, you don't get any power for it.

Next, please. The design criteria comes from actually two places. One is RP33 and the other is IES lighting handbook, 9th edition. And in dark conditions what they have is basically 2 to 5 average footcandles per facade, depending once again on the exact conditions, listed in the report if you care to look at that.

And if the surroundings are bright, 5 to 15 footcandles. I will comment that these recommendations have decreased over the years. I've noticed that some floodlight manufacturers are still suggesting levels that were recommended by the IES in their 5th edition handbook, back in the 1970s. So they have changed a little bit.

But what RP33 and the handbook have are very similar. There's only one area where there's a difference and that's when you have bright

surroundings and the dark levels.

Next slide, please. If you see the lighting zone description and the footcandles that were selected, I'll get down to what I was saying in just a minute, starting out with the dark critical zone of lighting zone 1 there really isn't any reason to have facade lighting. So no facade lighting allowance.

For lighting zone 2, 3 footcandles was selected. Once again, a dark ambient and then a medium light wall, not the absolute lowest level, but a medium level.

For lighting zone 3 a bright ambient and then a light wall. And the light wall was selected because frankly when you want to illuminate a wall and make it look bright it doesn't make much sense to start out with it dark. So I think that the designers of the building, the architect, will probably select a lighter wall rather than a darker wall if they want the darn thing to look light when you shine light at it.

Then finally the last one in lighting zone 4, a bright ambient and a medium dark wall was selected at 10 footcandles. RP33 has their highest level as 10 footcandles, and they say a

dark wall. The handbook modified that slightly, they said that for a medium dark wall they want 10 footcandles, the same level, and then they added one for a dark wall, not a medium dark wall, but a dark wall and 15 footcandles.

But, once again, the same argument. If an architect wants a wall or a facade to look light at night, why does he start out with a dark one. So that seemed like a good one to choose and still make some conservative calculations.

For all the models these light loss factors, 0.70, as the other people did here today. And I also used the mean lamp lumens in the models. And once, again, this a 40 percent of rated life. And actually it's fairly close to the rated light output at the end of lamp life.

Next slide, please. The various sources that I selected, now here's a table of what I had available to choose from, and in fact I didn't choose incandescent or halogen, or even the BiXT5HO in the models, but these were some, and the man lumens per watt that I had to choose from in the models.

In fact, what I used was small CFL for one and the T8/T5 and metal halide for the models.

Next slide. The models that I chose were in different lighting zones. A couple of them in lighting zone 2, one with the compact fluorescent lamps and another one with the T5.

In lighting zone 3 I developed three models. Once again the T5 lamp and a couple with metal halide lamps. And then in lighting zone 4 metal halide seemed the most appropriate.

As you can see the footcandles vary by zone, as I said before. And then the width and the height of the models. Once again, if it's in a small lighting zone -- lighting zone 2, for example, fairly small facade and then they would get bigger and bigger with the higher lighting zones because you would expect to have bigger buildings and bigger facades where it's a brighter atmosphere in general.

Next slide. And the recommendations based on the models. Once again, lighting zone 1, no facade lighting. Lighting zone 2 was 0.18 watts per square foot. Lighting zone 3, 0.03 watts per square foot. And finally in lighting zone 4, 0.5 watts per square foot.

Next slide. In the lighted area, in the recommendations basically the lighted area allowed

lighting power density. For the lighted area you use the entire facade for the lighted area. So the thought is that you're going to be lighting the whole thing, either relatively uniformly or what's probably better, you find highlights of that facade that you're going to accent.

But if you don't light an area, if you intentionally don't provide light on an area, then you can't count it. Once again, there aren't any tradeoffs between any facades or other outdoor lighting areas. If you light the front facade, but you have another facade on the back of the building, you can't count the area on the back of the building as part of your facade lighting. The area that you calculate with to determine your power density.

Once again it's use it or lose it, so if you don't light the facade, you don't have any power allowance. And finally, if you light a roof it's considered a separate facade.

Next slide. And then title 24 right now mandates control to turn off lighting during the day, and that's going to continue. But there's an additional mandatory requirement proposed that a control be added so that the lighting power can be

decreased by at least 50 percent. And this could be a control to just turn off all the lighting if you want to turn off all of it, but at least 50 percent to comply with what the Governor has suggested in his D1900 proposal.

Or some other curfew that say a local city or ordinance or utility may request or something like that. So this would allow facade lighting to be adjusted to comply with any curfew that's established.

Any questions?

MR. FLAMM: Mr. Trimberger.

MR. TRIMBERGER: I didn't understand, you seemed to conflict with yourself on the area that you would use in the calculation. You used the entire facade, but if you only light part of it you only use that part that's lit. How do you determine that part that's lit?

MR. AYERS: Well, it's going to depend on the facade. For example, if you have a highlighted area that's obviously different from a regressed area of the facade, and you're lighting this area, then that's the area you use to calculate.

MR. TRIMBERGER: How am I going to know

that?

MR. AYERS: It's going to depend on the design of the building. And there's obviously --

MR. TRIMBERGER: If it's a flat facade and they're going to highlight this area over the entry, but not over this area here --

MR. AYERS: If it's a flat facade there isn't any difference. But, for example, if you have a regressed area that doesn't have any light shining at it, then it's not lit.

MR. TRIMBERGER: Yeah, it's awful hard -- it's difficult in, you know, planner view to figure that out, you know, which area is going to be lit and which is not. It looks problematic to me. I don't need to belabor it.

MR. AYERS: Yeah, I hear what you're saying. Okay.

MR. SHIRAKH: We've actually talked about this, Tom, and we know what you're talking about.

MR. FLAMM: Were you done, Tom? I'm sorry.

MR. TRIMBERGER: Yeah, I'm done.

MR. FLAMM: Okay, go on.

MR. TRIMBERGER: I get brief late in the

afternoon.

(Laughter.)

MR. ABRAMS: Jim Abrams, California Hotel and Lodging Association. Maybe I missed this, is the facade -- how are you defining the term facade? I know what it means generally. What I'm worried about in particular, you will go to a lot of business establishments and they will have a very unique identifying emblem, symbol, icon or something like that that may actually be part of the building exterior.

I'm thinking of maybe like a DaysInn sign or a BestWestern or --

MR. AYERS: I think --

MR. ABRAMS: -- and you look at the --

MR. AYERS: -- you're defining it right there when you said sign. This isn't for signs.

MR. ABRAMS: I understand that, but --

MR. AYERS: Okay.

MR. ABRAMS: -- if you look at like the M, the golden arches, sometimes it's not a sign, it's just literally built into the side of the building. And that is how people see, in addition to whatever signs they have, and I appreciate that's regulated elsewhere, but does the facade

mean anything that's on the outside of my building?

MR. AYERS: No, it doesn't mean --

MR. ABRAMS: Any portion of the outside of the building?

MR. AYERS: -- anything, and specifically if you have an emblem, and often it may have separate lighting, a sign of some sort that's attached to a facade isn't the facade.

MR. ABRAMS: So a facade is just the outside shell of a building --

MR. AYERS: Right.

MR. ABRAMS: -- and doesn't include any adornment, icon or something that's built into it or added onto it? That would have it's own separate --

MR. AYERS: Right.

MR. ABRAMS: -- lighting criteria as you've explained here today applied to it? Okay. Because what concerns me --

MR. AYERS: That's the intent.

MR. ABRAMS: -- is the idea that in lighting zone 1 there wouldn't be any lighting allowed for the facade. And, again, aside from security issues, which I know I needn't address,

but --

MR. AYERS: But using that as an example, let's say there were an emblem that someone had to light in lighting zone 1, then they use their 20 watt allotment for signs.

MR. ABRAMS: As a sign. Okay. I wasn't sure what the term facade meant exactly. Thank you.

MR. FLAMM: Okay, yes.

MS. DAVIS: Leslie Davis, Auerbach and Glasow, lighting consultants. Larry, I wanted to just caution you a bit when you're talking about historical illumination. My first take on this was oh, they're talking about historical monuments or buildings.

So, since that is an architectural term, and I think this is just your description right? This isn't part of the document? So if we could make sure that we clarify.

As I understand, historic buildings would be exempt from this code, exterior, just as they are interior? Okay.

MR. AYERS: We believe so, yes.

MS. DAVIS: Okay, thank you. The other question was for very tall buildings is there any

adjustment factor as there is in interior buildings when you have a large volume space?

MR. AYERS: No, there's no separate factor for a tall building. So, it would still have to comply with the lighting power density.

MR. FLAMM: Okay, everybody's getting tired, I see; comments are getting fewer with each element.

And with that we'll move on to our last element, other than open floor forum, we will have Ms. Heschong go over building entrance and exit lighting. Building entrance and exit, it was number --

(Off-the-record discussion.)

MS. HESCHONG: This measure describes entrances to buildings and entrance canopies. Basically it covers any area attached to a building which includes a door to the outside. So the entrance does not necessarily need to be at the ground floor. It could include an entrance at a balcony level.

Some of the issues that are involved with building entrances are that there's a key task of getting into and out of the building safely. There are often thresholds; there are

often stairways and ramps that need to be negotiated.

But there's also very important way-finding function of being able to very quickly identify how you get into the building, and where the entrance is properly located.

As part of that way-finding indicator, it needs to be a brighter area. Building entrances also provide a transitional space between interior and exterior illumination, giving the eye a chance to adapt as opposed to interior as you're moving in, but also to exterior conditions, which takes a longer time.

So as you're moving from very brightly lit interior conditions you need a space of mid lighting levels while your eye adapts to the lower exterior lighting levels.

Types that we have considered include front doors, side, exit doors, any kind of a covered or uncovered entrances, loading docks, utility service entrances, and also, to some extent, patios and balconies. As I said, exterior spaces with a door to the inside.

Next. So, some examples of what you're looking at and some of the conditions that we

found in the field. I think these help to illustrate the issue of a transitional space between indoors and outdoors.

It was also very clear to us that it is extremely common in this day and age to have building entrances which are glass storefronts. What that means is that there is very low reflectance of the surface that you are trying to illuminate when you're trying to provide way finding, too.

In the photograph on the upper left, which is an entrance, you can very clearly see that the stairs are brightly illuminated; the canopy is glowing and is providing the indicated this is the entrance to the building.

Whereas the photograph down below for the Radio Shack is actually the interior illumination that's providing that guidance. The exterior illumination is doing very little that can be read far away. It's providing direct illumination that you can measure as you're entering the space, but it's not contributing much to the visibility of the entrance or people in the entrance area.

So, those were some of the challenging

conditions that we needed to account for in the modeling.

Next. Our design criteria that were addressed include the IES lighting handbook that identifies two types of entrances, active entrances and inactive entrances. They suggest different vertical and horizontal illumination standards.

We chose to treat all entrances as active on the assumption that they could become so in the future. And that a building code official could not obviously distinguish between what would be considered an active and an inactive entrance.

Looking at what the appropriate illumination levels should be, given the types of illuminations that were being proposed in the other measures, parking areas, we're looking at footcandles that are ranging from about half to about 5 footcandles. This is maximum, not the minimum we were talking about earlier.

And then the illumination of the interior entrance, as you go in the door, which typically is a lobby area, hallway for a building, minimum at about 20 footcandles; maximum these days at about 70 footcandles. So that's the range

of illumination.

From that we derived a set of standards for entrance illumination that ranged from a minimum of 2 footcandles to a top condition 15 footcandles.

Next. We developed models in lumen micro, and we attempted to use the most extreme conditions that we expected to find in the field. Two of the extreme conditions that were assumed in the models was one, that the ground reflectance was asphalt, it was very dark at 7 percent. So that makes it more challenging, there's less reflectance upwards. And also that there was a very large glazed area at 25 percent reflectance, so that we weren't able to get additional reflectance off of the walls of the entrance area.

From this we developed a number of models looking at both entrances that had no overhang; however, our survey in the field that of normal active entrances to buildings, 95 to 100 percent of them have some coverage. And so it's very unusual condition to have a commonly used entrance that has no cover to it.

Next. The same 55 mean lumens per watt, and 70 percent light loss factor that were used in

the other models.

One of the key areas here is what is the definition of the area for the entrance. The more extreme and rare condition when it is uncovered we defined as the area eight feet in front of the doorway times the width of the doorway plus three feet to either side of the doorway.

So if you have three foot wide doorway that has no covering over it, it would be a nine foot depth times -- excuse me, an eight foot depth times a nine foot width, 72 square feet that we're trying to illuminate for that entrance.

If you had a loading dock, say a 10 foot wide garage door that you were opening, then the width would be 16 feet, three feet to either side, and then eight feet in front of that.

Now, the much more common condition where there is some kind of a canopy over the entrance, the area is defined as the canopy area, the projected horizontal area underneath the canopy. And there is no restrictions on how large that can be.

So, to the extent that the building owner has made an investment in creating a larger covered area as part of a protected area that's

going to be actively used, all of that is included in this lighting power allowance.

And so there's no limit on the size of covered area related to an entrance.

Next. Using this technique, the calculations we derived half a watt per square foot for lighting zone 2; double that, one watt per square foot for lighting zone 3; to go down to lighting zone 1, we found that in the extreme conditions where we had very small areas, and low reflectances, that we could not get quantum of light sources that were small enough to decrease the illumination levels. And so we kept the power allowance for lighting zone 1 also at half a watt per square foot.

For lighting zone 4 the power allowance was taken up to 50 percent so that that's basically using 15 footcandles as the standard for lighting zone 4.

What's interesting, and I think worthy of some comparison, is looking at how these numbers related to the other numbers that were generated for the sales canopy areas. And how they are slightly different.

For the gas station canopies, they are

higher. And for the non gas point of sales canopy they're slightly lower than these values.

So, in that case, if you had an establishment with a covered sales area that was selling fruit or Christmas trees, the illumination level would be sightly lower than it would be for the entrance area. And you would still keep that hierarchy of way finding for the entrance areas.

The lighting control requirements are very similar as what had been proposed elsewhere. In this particular example for lighting zone 3 and 4 there are two alternatives. Either to use bilevel switching, which takes the illumination level down by 50 percent after curfew. Or alternatively, using an occupancy sensor which will switch lights on to full power if someone approaches, if that's the preferred mode.

But that would be combined with a photosensor so that it does not happen during the daytime.

In lighting zone 2 the bilevel switching isn't an option that's taken just to the occupancy sensor, and then lighting zone 1 the assumption is that the entrances are full off during non business hours after curfew.

And that's the last of the slides. So we can take questions or comments.

MR. FLAMM: Yes.

MR. ABRAMS: Jim Abrams. A consideration, please, if you could take a look at this, and I don't know quite what it means. I would like to factor in the fact that in many lodging establishments that kind of a facility or that type of an area is a vehicular way, whether it's covered or uncovered.

And especially if it's uncovered I understand that the amount of space that will be considered to be the area is limited by the width of the door plus six feet times the eight feet. If it's uncovered.

MS. HESCHONG: If there's no cover, --

MR. ABRAMS: Right.

MS. HESCHONG: -- right, it's eight feet from the door.

MR. ABRAMS: And if that's a vehicular way, meaning the cars are coming and going, people dropping off and picking up, and things like that, we've got some safety factors that we need to consider.

Maybe the easiest way is to allow

something extra if it is a vehicular way, in addition to being an entrance.

And the other thing we know from accessibility standards, we have to have curbs. You walk out of a hotel, covered or uncovered, you have to have a curb so that people with low visibility or people who are blind can differentiate when they're going to step into the vehicular way.

I'm not quite sure what that does. I notice in the case of lighting zone 1, it's either to -- I don't remember if the slide said full off or full off or -- I think there are going to be some very significant safety risks if you have a vehicular way, regardless of whether it's in Yosemite Valley or in downtown Sacramento.

So those particular areas where there is a real risk of injury, I suggest we might want to, we, with you, look at that as a consideration.

MR. PENNINGTON: I think what full off means in that case is that there's no lighting controls required.

MR. ABRAMS: I inferred the opposite; I assumed the lights would be either full on or full off. I didn't understand --

MR. PENNINGTON: Well, you have a light switch.

MS. HESCHONG: The general proposal is the curfew is defined as after business hours, so if you have a 24-hour operation --

MR. ABRAMS: So if there's an exemption for R1 occupancies that may help deal with that. But, again, even if it's a place where cars, vehicles pull up and drop people off and shuttle buses are coming and going, I'm just worried about the safety factor.

MS. HESCHONG: That's a good point.

MR. PENNINGTON: Lisa, what did you have in mind for controls in that case? Were you assuming that there were going to be controls for lighting zone 1?

MR. ABRAMS: I just saw full off, full off. I didn't know what --

MS. HESCHONG: Yeah, the assumption is that after business hours the lights are off.

MR. PENNINGTON: So you have a control to get that to happen, a time clock or something?

MS. HESCHONG: Right. But if you have an operation that's running 24 hours a day, that never occurs because it's never after business

hours.

MR. ELEY: So we would have an exception for 24-hour operations.

MR. ABRAMS: And that might be the best answer for a lot of these issues.

MR. SHIRAKH: That's very similar to our automatic shutoff controls for interior. And it basically exempts 24-hour operations.

MS. HESCHONG: Let me ask Jim, actually, if I might, your comment about safety for drop-off. What you seem to be implying is even if that drop-off is not immediately adjacent to the entrance to a building that it needs a higher level of illumination than we might find, for instance, for parking lots or roadways?

MR. ABRAMS: Possibly so. I'm separating out the security issue, which is the parking lots and things like that, from the drop-off. Because I've seen many many hotels where you have a vehicular way that will come in off the main street and people will either get on or off or in or out of cars or whatever, shuttle buses. And then there'll be a landscaped area between that drop-off/pick-up place and the actual front of the building.

I'm afraid if it's not covered then the lighting stops eight feet out. I'm not saying it quite accurately, but you know what I'm saying?

MS. HESCHONG: Well, the lighting would then go to another category --

MR. ABRAMS: Right, yes, --

MS. HESCHONG: -- the buildings and grounds category, which is lighted walkways; or it would go to parking lot category --

MR. ABRAMS: Which I think, if I remember the numbers correctly, are lower.

MS. HESCHONG: They are lower, but they're deemed to be adequate for getting in and out of cars.

MR. ABRAMS: Okay, I'm worried about people walking across a place to a parking lot and having cars go by. Just too many lawsuits. But, again, I don't know quite what the answer is. That's what I'm concerned about.

MR. FLAMM: Thank you. Mr. Trimberger.

MR. TRIMBERGER: For the record, table 19 shows -- level 0.05 for LZ2, which I assume is not --

MS. HESCHONG: Yes. And that's incorrect, thank you for catching that.

MR. TRIMBERGER: Also if you've got multiple entrances you're going to look at each one individually, is that right?

MS. HESCHONG: Yes.

MR. TRIMBERGER: Is there a tradeoff between one entrance and the other entrance? Or do we know yet?

MS. HESCHONG: At the moment the assumption is that entrance lighting is part of the general allowance for the site. It's not --

MR. TRIMBERGER: Okay. I'm real mixed up on curfew. That's been throwing me for a loop all day.

We said earlier that was determined by local jurisdiction. Now we're saying it's according to business hours. And your definition in here says a time period during the night during which some outdoor lights are required to be turned off or dimmed.

What's a curfew?

MR. SHIRAKH: We talked about this. I think you just stepped out this when we talked about it. We're not going to have building officials enforce curfews. All you're going to do is make sure that the equipment is there to --

MR. TRIMBERGER: To make sure that the controls are there and then whatever happens after that is --

MR. SHIRAKH: Not your -- it's very similar to the automatic shutoff controls for interior buildings. I mean your job is to make sure that the astronomical time clock, photocell is --

MR. TRIMBERGER: Have to see they're operating when I final the building?

MR. SHIRAKH: Well, there could be some commission requirements for it, too. But, again, you're not responsible for enforcing curfews. Once permitting is done and equipment installed, you're out of it.

MR. TRIMBERGER: But, you know, in some ways I am because I am going to be looking and saying okay, this guy is going to be 24 hours a day he's a motel, so he does need the controls.

So, I'm just trying to understand --

MR. SHIRAKH: Yeah, you know, -- automatic shutoff controls, if we have a hospital that's 24 hours, there is no requirement for automatic shutoff control. The same thing for a 24-hour operation outdoors. If it's less than 24

hours, then there may be --

MR. TRIMBERGER: So it is tied to the hours of operation?

MR. SHIRAKH: Just like automatic shutoff controls are, you know, for interior, indoor standards, every building that's, I guess, larger than 5000 square foot is required to actually -- we remove that exemption.

There is --

MR. TRIMBERGER: Okay, what about like a grocery store that's not open during the day, but they have staff that gets in to stock it at night. Is that open, does that require curfew controls? That's a common thing.

MS. HESCHONG: That's the assumption where the occupancy sensors, 50 percent reduction would be an appropriate choice. Certainly an occupancy sensor in that situation where you have active use after business hours.

MR. TRIMBERGER: They'd be required to have it, or they could have it, or --

MS. HESCHONG: It's an option for compliance.

MR. SHIRAKH: Typically the business hours are defined by when it's open to the public.

You know, we have the situation like Home Depot people going about stocking shelves, but, you know, we define business hours as the hours that they're open for business to the public. Not by janitorial or other types of functions.

MR. TRIMBERGER: Yeah, that conflicts a little bit with like our ordinance for parking that says it needs to require that lighting level, whether it's open or not. So we don't have that requirement to shut it down. We want that light for security all night.

MR. PENNINGTON: Again, we're asking you to look for the controls. And how you allow them to operate their building is up to you. And if you don't tell them how to operate their building, it's up to them.

MR. TRIMBERGER: Well, obviously I can't tell them because if I've got, you know, I've got an energy, a state requirement that says one thing, and a local requirement that says the opposite.

MR. PENNINGTON: I don't understand you.

MR. TRIMBERGER: Okay. Like I said, I'll have to get into the numbers later, but, you know, I've got a requirement that they have to be

able to provide so many footcandles in their parking lot.

I'm not allowed to say, hey, during the curfew cut that in half, or cut it down to nothing, or whatever the requirement is.

MR. PENNINGTON: Okay. So whatever your requirement is related to curfew, that's what you're going to enforce. And these standards don't have any effect on that. You're just looking for the controls.

MR. TRIMBERGER: So my local preempts the state, is that it?

(Laughter.)

MR. TRIMBERGER: That's a first.

MR. PENNINGTON: Write that down.

MR. TRIMBERGER: Okay, that's something I'm going to have to figure out, but that looks -- that's part of the problem that I've been foreseeing for a long time.

MR. PENNINGTON: It doesn't really preempt because we don't have any requirements for curfew. You're --

MR. TRIMBERGER: You have controls for curfew.

MR. PENNINGTON: We have controls,

period.

MR. ELEY: We should probably take the word curfew out of that.

MR. PENNINGTON: Yeah.

MR. ELEY: And it's just -- Mazi keeps making the analogy with bilevel illumination for indoors. And it's really that. We want to be able to -- we want to have controls so that the lighting can be turned off when it's not needed. And in some cases we want to be able to reduce the brightness of the lighting by 50 percent.

And that's really, I think if we took curfew out of the proposal it might be a lot more clear. It just stated it clearly in terms of control capability.

MR. SHIRAKH: We tried to clarify that specifically with building officials in mind because we didn't want to put you guys in a position of enforcing curfew.

The analogy is very similar to indoor lighting, automatic shutoff controls and bilevel switch. And once you're done with that you're out of there.

MR. TRIMBERGER: Thank you.

MR. FLAMM: Okay, Dawn.

MS. DeGRAZIO: Dawn DeGrazio, Sacramento Municipal Utility District. I noticed it was mentioned by Lisa in her presentation LZ1 same LPD as LZ2 because there was an inability to get to appropriate lighting design for the area without going to a lower -- in other words, going to a lower LPD you couldn't light it appropriately.

So what then we end up having is a conflict between energy savings and appropriate lighting design for the LZ1 condition -- actually the balance is between if you want to have the energy savings, if that's the overriding condition, then you do it this way and you don't go any lower than a half a watt per square foot; even though that might be more light than the LZ1 condition should have.

And then the other side of it is to light the LZ1 condition to a very low light level because it's an intrinsically dark area in this building entrance area, and this also would apply to the sidewalk notion that Nancy Clanton spoke about earlier. She had trouble getting to appropriate lighting with the high efficacy sources, metal halide. And lighting from poles and getting to the low light level and uniformity.

The way to do it is to go to the "i" word, incandescent or halogen. And then you can get to a low light level. You have dim-ability; you can have uniformity. Obviously that's not an efficacious source; it's not a long life source. There are a lot of -- I'm not saying that that's the thing to do, but I think we have to think about where, you know, what we're trying to do.

In each case -- I'm not saying what the answer is, but in each case which is more important. Is it the energy savings or is it appropriate lighting design for that particular area.

And it looks like LZ1, in some cases the appropriate lighting is going to be an incandescent or halogen or a low voltage halogen system and not the high efficacy metal halide. Compact fluorescent is a possibility, but it's not useable everywhere in climate conditions.

So just opening a new can of worms.

MR. FLAMM: Well, under 100 watts does not have to fit the efficacy requirement.

MS. DeGRAZIO: Right. Okay, the way that I read this was that the light source, itself, if it's under 100 watts doesn't have to

meet the LPW, but we still have lighting power density, the power requirements, we are still limited at .5. See what I mean?

And if we were to go to a low light level without having done the calculations, if we were to go to a low light level and do with incandescent, would we necessarily come in under the .5. We might be over the .5 in watts per square foot, but you know, even though we're at a lower light level. Because there's such a huge difference in efficacy between metal halide and halogen.

MR. FLAMM: Thank you.

MS. HESCHONG: Let me respond to that quickly. Dawn, one of our limitations was a) to meet these criteria, but also to limit ourselves to readily available technology.

So if the technology wasn't available in that quantum, that was a restriction on the design.

MR. FLAMM: Now, is there any other topics that we did not discuss today that are dear to your heart? Yes.

MS. FRAGA: Good afternoon.

I'm Cheryl Fraga; I'm the General

Manager of Gardco Lighting, San Leandro, California; and a member of NEMA's luminaire section. And now that we finally got rid of all those other associations, let me tell you who you should be working with most intimately is people who can not only express concerns and possible hurdles and pitfalls, but people who can also offer you solutions.

The NEMA luminaire section certainly has a broad range of luminaire manufacturers; access to the lamp and ballast manufacturers, as well, through other sections of NEMA, such that we can really assist this committee in developing standards that can be met with perhaps more open arms than you saw today.

NEMA faxed a letter yesterday drafted by our manager of government affairs. It should be on record. It went to Commissioner Rosenfeld.

And NEMA's concerns are broad, and yet few, in terms of the bottomline concerns. We're concerned about the speed in which these standards are moving forward, an adequate amount of time to assess and really examine the breadth of material that you're dealing with here.

And we're concerned with the lighting

models. And the lighting models are critical because they lead to the LPDs that owners are going to have to deal with.

I shipped 3000 orders to the state, somewhere in the State of California last year. I hope the 400 sites that the PIER study looks at will be representative of what actually does exist out there.

I didn't ship a 400 watt luminaire to any auto dealership in California or anywhere else in the country. They use 1000 watt luminaires as common practice.

I ship very very few 250 watt or lower luminaires for use in standard parking lots; 400 watt lamp sources are still most commonly used in parking lots.

While the IES standards are the only standards for illumination that do exist, the reality is many many owners and lighting professionals do not use those as their guidelines in developing lighting specifications.

Lighting is personal; lighting is perception; and lighting is diversely practiced outside the building. We live, unfortunately, in a litigious society, and owners these days

particularly are concerned about safety and security in their parking lots.

And I'm also concerned that if we don't work together that the State of California will be opening themselves up to potential litigation by someone pointing to these standards.

I'm also concerned that we need a fast and non bureaucratic way to change a lighting zone when needed. I've noticed in my 15 years in living in California how an area can explode rapidly, much sooner than the census can get there ten years later to determine that the population has changed.

I know in the Bay Area where I live I have many people that come to work at my factory every day that live in Tracy, which was farm country only a few years ago, and is a little city today, where lighting standards need to be updated to reflect the population in that area currently.

Retailers in particular are using lighting as a marketing tool. And when the retail association finally learns of your standards, they're going to be another group of people up in arms, because they are using lighting to attract customers.

I'm concerned that maybe there's some underlying agenda here that is unrelated to energy savings and consumption. When you start to talk too frequently about light levels and cutoff, you are introducing other lighting issues that are disparately different from energy consumption.

My company invented cutoff optics. If you would like to put a big chunk of my competitors out of business I would welcome you to do that. In point of fact, semi cutoff optics frequently are the design of choice to minimize energy consumption. They may introduce glare into a site. They may not comply with some folks that want no light above 90 degrees. But particularly in wide open areas with tall mounting heights semi cutoff optics give you the opportunity to space poles more broadly, which definitely leads to minimizing energy consumption.

So, we're going to have to be careful about how we weave issues like light trespass and cutoff into a regulation whose primary goal is to conserve energy.

While title 24 for interior doesn't seem to preclude the use of certain luminaire types, it sounds like the exterior regulations are leaning

towards doing that. When you say that refractive globes are poor and non cutoff, and therefore shouldn't be used, there again, thank you very much, you're taking a good chunk of my competition right out of the marketplace.

But that's why objective NEMA members can help guide you as to how those products are used, and when they might be more appropriately used.

I have unbelievably bad news for you. My company just published in the last 60 days an energy guide for outdoor lighting that we've been sending out to professional building owners to help guide them towards outdoor lighting solutions that can save them energy.

In developing that guide we did a lot of investigation into lighting controls. And the sophistication of interior lighting controls in today's market is mind boggling. You can control an entire system including HVAC from a PalmPilot now, and guess what, all we have for exterior lighting are pretty poor, low quality photo controls and occupancy sensors, which really are not designed for exterior lighting environments.

They're not UL wet location listed, so

they cannot live and survive outside of covered areas. There's inherent difficulty in using occupancy sensors outside a building. Birds, weather, rabbits can actually trip these occupancy sensors. It's almost impossible to control them out in a parking lot environment.

And here is where potentially a better partnership with NEMA can help you to push NEMA members to do something about developing controls that can be married with exterior lighting.

But regulating, demanding owners control exterior lighting is going to be challenging for them. And we're going to have to educate not only this gentleman's organization, but specifiers and owners regarding the very limited ways that you can actually use controls in an exterior environment.

Last fall Cheryl English and I met with Mazi and with Bill, and at that time we thought we have an understanding that we could be part of the standards committee in order to help guide the regulations, in order to help be a conduit for bringing information to the Committee. And we'd like to re-propose today that you reconsider that position and allow us to work directly and closely

with you, so that we can help you to understand some of the more real world challenges that are faced by specifiers and owners every day with exterior lighting. And how we can somehow make everybody happy when you propose a new building code.

The PIER study, I suspect, will get you to some existing practices, but will exclude a huge chunk of technology that can actually be right in line with what you're trying to do.

There are new sources on the market right now that can allow you to achieve similar light levels to a 400 watt lamp, for example, while saving 80 watts of energy with every lamp you install.

So, there's a variety of ways that new technology can come to bear, and I think if you at least have the knowledge of some new technology and can present that as options to people that will have to comply with these standards, that you'll be a more user-friendly CEC when you put these out.

So, we'd like you to reconsider working more closely with the NEMA luminaire section and we're standing ready to assist you in any way we

can.

Thank you.

MR. SHIRAKH: Couple questions. Are you suggesting we shouldn't be using IES publications?

MS. FRAGA: What I'm suggesting is that common practice frequently is not to use them. And why is that? Because people want more light than is recommended by many of the IES standards.

It's just a fact of life that retailers, hotel and motel owners, everybody in the hospitality industry, if they'd look at the IES recommended standard for the activity in that area, and even if it says one footcandle minimum, they say, give me two, give me three.

We've been working with WalMart, the number one retailer in the world, for over 20 years. In 1975 WalMart was using 1.5 footcandles minimum, and they've had to increase that footcandle level in the past few years because they're in urban areas competing with other retailers who are using light to attract customers.

Is that always the right thing to do? Not necessarily. It's just what's commonly being practiced by owners. And that's why you just need

to know that.

Whether we agree with it or not, I've got four application engineers who are asked to design to higher light levels every single day. So it will be a rude awakening when they find out they can't do what they perceive is the right thing for their business, what they perceive leads to increasing their income.

WalMart increased their facade lighting after they did a study and found out they increased traffic in that store 25 percent at night when they did that.

We worked with PepsiCo Corporation who increased their light levels in their parking lot, brought 1000 watt luminaires down at 25-foot mounting heights in areas where gangs were a problem, right here in this state, and they got rid of that problem. So they perceive that lighting solves a whole bunch of other problems, other than to just provide some light in the parking lot. Got a gang out of my parking lot; it drew the kind of customers I want, you know, families.

So, owners do have a perception when it comes to exterior lighting that it does other

wonderfully magical things for them. And in some cases, it does. If you're a TacoBell manager and got a gang in your parking lot; and you changed the lighting and they went away. You really feel you've solved a problem.

So those are the kind of real world issues that are going to come up.

MR. SHIRAKH: Also, on the question of semi cutoff, I'm a bit confused. We backed off from full cutoff based on NEMA recommendations. We had testimony in the last workshop.

MR. ELEY: We have a letter from them.

MR. SHIRAKH: And now you're saying semi cutoff; it seems like, you know, -- I mean, again, a lot of issues involved. It's just not -- there's glare, there's energy efficiency, and --

MS. FRAGA: I think that there's a few things at work there. Certainly my company promotes cutoff optics every single day. We believe, you know, glare is intrusive and not necessarily the best lighting design.

And I think there's a lot of NEMA members who feel that way and also are trying to support the, you know, the lighting professionals that are on your standards committee, by

supporting those kinds of regulations.

What I'm suggesting to you is that there are owners, like the auto dealers, out there who use semi cutoff optics. There are mall developers who use semi cutoff optics that are going to present a challenge for you. And the auto dealers do it because there's no amount of light that's too much for them. And the mall developers do it because they can increase their pole spacings and therefore use less equipment.

And in so doing you use less luminaires. You're going to burn less lamps. You are going to reduce your energy consumption. So they're going to come to you potentially and say that's in conflict with saving energy if you don't allow me to use semi cutoff optics.

So, there may be some exceptions that might have to come into play. These are just real world problems.

MR. FLAMM: We looked to the IES recommendations, both RP33 and even in RP2. And in addition to minimum/maximum ratios there's warnings of glare on both of those documents.

So, yes, energy is our main concern, but we cannot do poor lighting design compared to what

IES directs us to do our models, so our models were directed by the IES recommended practices to address glare.

And so, you know, that's what we're trying to do is follow the IES recommendations for controlling glare.

MS. FRAGA: And because that's a fine line to walk, and difficult to maneuver through the minefield of regulating glare to the point where you start to get away from solutions that cause you to save energy, that's where you need to be working with the luminaire manufacturers.

For example, I heard about horizontal lamps all day long. My company promotes horizontal lamps all day long. But there are vertical lamps now that can be used and provide you with cutoff, and full cutoff.

My company worked with a lamp manufacturer to develop a lamp that could be vertically positioned in order to appease that component of our customers that has vertical lamps on their mind, and still offer full cutoff.

We did that by dropping the R2 down with inside the lamp envelope, and offering a lamp that would be energy efficient and still allow them to

get most of the benefits of vertical lamp optics without actually having a sag glass and the lamp drop below the product.

So you can achieve a cutoff with some minor modifications in design with some standard products. And those are the kinds of solutions that you'd be able to offer some of the people that are going to object to lighting with only horizontal lamps and cutoff optics.

MR. SHIRAKH: The standards assumed, for modeling purposes, horizontal lamps. But that doesn't mean people can't put in vertical lamps --

MS. FRAGA: My concern about the models, though, is that they lead to the LPDs. And so when you use only horizontal, low wattage luminaire configurations to develop LPDs, and you've excluded another big chunk of what is common practice, you're going to end up with LPDs that are significantly lower than what people are used to, which is going to be a much more difficult event for them to deal with when they see they got to throttle back their light levels by leaps and bounds.

I can see auto dealers, you know, telling you that you're, you know, you're

restraining trade. If you build a dealership today on any auto mall row and you can use 1000 watt luminaires. And the LPDs for auto mall dealers are developed based on only using 400 watt luminaires in the model, then a new guy going onto that street to build a dealership is going to feel like his, you know, his dealership doesn't have the same opportunity to compete because his light levels are going to be so significantly different through, you know, complying with the standards.

Thank you.

MR. FLAMM: Thank you. Anybody else have any other comments, questions?

Okay.

MS. HESCHONG: Observations?

MR. FLAMM: I want to thank everybody for participating, everybody on the webcast. And this will conclude this workshop. Thank you.

(Whereupon, at 4:50 p.m., the workshop was concluded.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of July, 2002.